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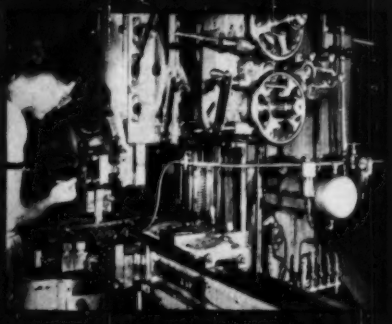

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Mot-O-Trol is especially valuable in paper, textile and machine tool industries. In the *paper industry* it serves rotary cutters, slitters, winders and single-intake shaft drive on combining, waxing or paper-treating machines; in *textiles,* warpers and winding reels; in *machine tooling,* planetary form and thread millers, grinders, milling machines, lathes, presses, screw machines and super-finishers.

Wherever used, Westinghouse Mot-O-Trol provides superior control and outstanding performance. Available in ratings from ⅛ to 30 horsepower, in standard or specially designed units to meet your requirements. Write to address below for your free copy of booklet DB-18-110-1.

Here's finger-tip control in one small station, containing start, stop pushbuttons and single dial speed adjustment. At left is a 2 horsepower non-reversing Mot-O-Trol with field control.

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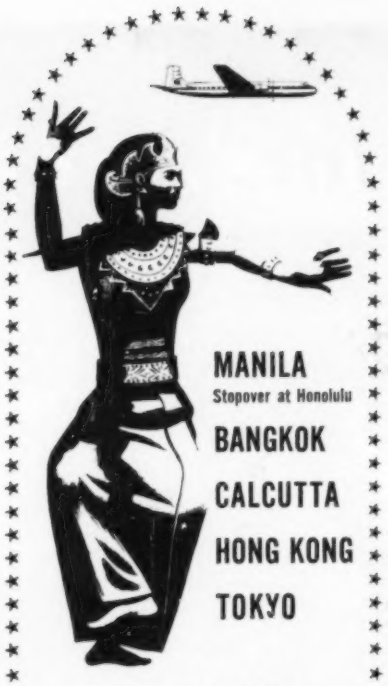

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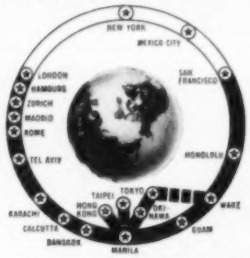

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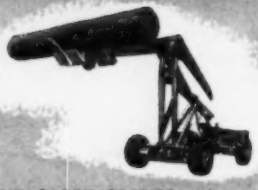
2.

UTILITY TRACTOR—for land clearing and general use. Four wheel steer, all wheel electric-drive. Weight, 15 tons and up.

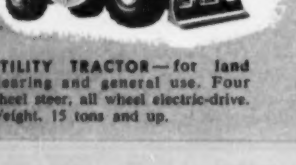
3.



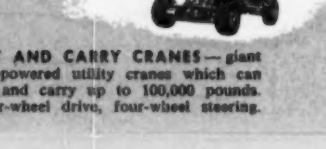
LIFT AND CARRY CRANES—giant self-powered utility cranes which can lift and carry up to 100,000 pounds. Four-wheel drive, four-wheel steering.

4.

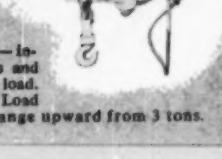
CABLE HOISTS—instantaneous starts and stops under full load. Weatherproof. Load lift capacities range upward from 3 tons.



CANE HAULER—loads in the field and transports off-the-road to processing center on huge rubber-tired wheels. Electrically powered and steered.



CARGO SHIPS—Electric drive, multiple screw. High speed, shallow draft. Ocean going. Capacities, 75 tons and up.



HEAVY MOVER—self-propelled mover. Lifts and moves 100 tons or more—oil well derricks, houses, mass housing forms.

Opens Great New Fields For YOU

LeTourneau Equipment Being Produced Today Is Revolutionizing Industries

. . . as did the pace-setting earthmoving equipment designed and formerly produced and distributed by R. G. LeTourneau, Inc.

Now, since the sale of the earthmoving equipment part of the business to LeTourneau-Westinghouse, R. G. LeTourneau and his manufacturing and engineering facilities in Longview, Texas, and Vicksburg, Mississippi, are producing equipment which has *dynamic application in other fields.*

This equipment, developed over a period of years, uses the LeTourneau electric motors and controls and other component parts which made the earthmoving equipment so successful. Illustrated here are 4 of these new products which are being sold and distributed — the land clearing saw (1), the utility tractor (2), the lift and carry crane (3), and the hoists (4).

Other new products shown are in the field, and are examples of the type of equipment which can be quickly designed and produced to fit a particular need.

LeTourneau Engineering Service

R. G. LeTourneau, Inc. maintains a full staff of engineers and designers. This experienced team, which has established 25 years of leadership in engineering advancement, is at your disposal. The team, headed by R. G. LeTourneau, foremost inventor of our time, has at its disposal hundreds of LeTourneau patents which may help you.

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LeTourneau equipment offers exceptional opportunity for aggressive, pioneering distributors. Selected distributorships for new LeTourneau products are available throughout the world. If you are interested and financially qualified, inquire promptly.

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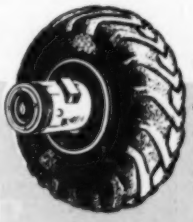

The Electric Wheel — Localized Applied Power

The electric drive wheel is a key element in LeTourneau propelled equipment. Inside the wheel a powerful AC or DC Tournatorque motor applies immediate driving power in *either direction*. The wheel, in several sizes, floats on huge tubeless pneumatic rubber tires. It is applicable to hundreds of tasks requiring fast, controllable power.

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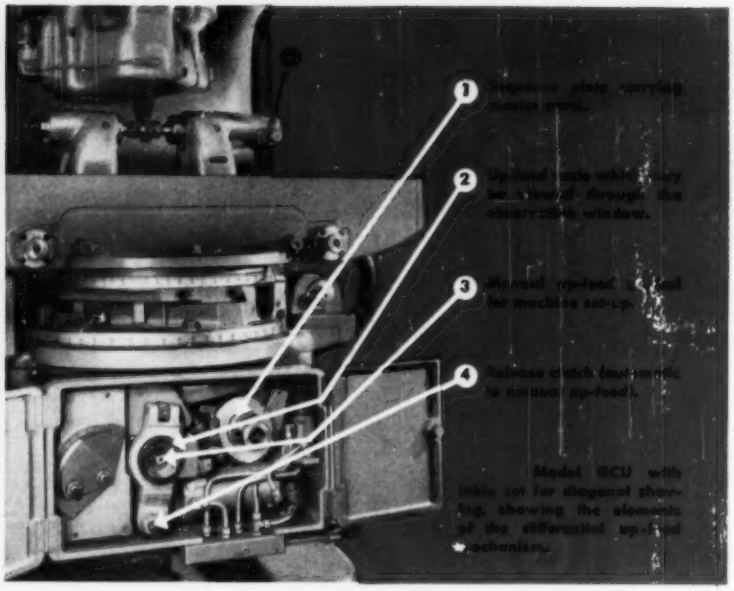
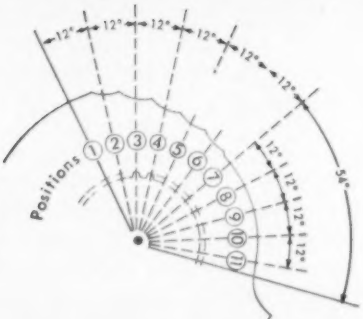


When Automatic Differential Up-feed and Conventional Crowning were added to the Red Ring Model GCU, shaving speed, flexibility and economy were all significantly increased.

AUTOMATIC DIFFERENTIAL UP-FEED

This efficient device provides for the first time an automatic cycle applicable to both diagonal and conventional shaving. This cycle is controlled by an eleven-position master cam. Included are backlash take-up, infeed cutting strokes, idling strokes and return to unloading backlash. The entire cycle or any portion of it may be used depending on job requirements.

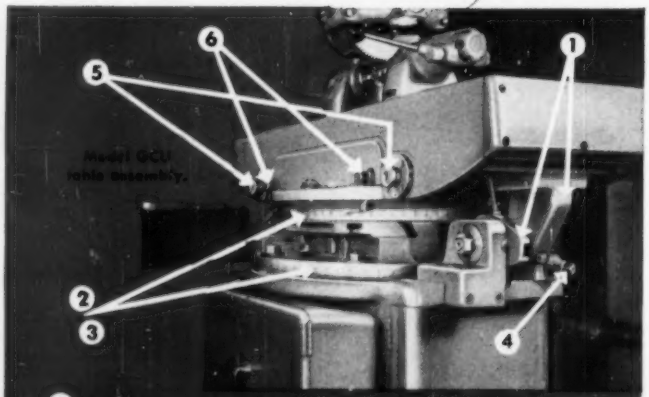
The cam itself does not actuate knee movement. It is strictly a stepped gaging device. Consequently every knee movement is positive, extremely precise and very fast. No danger of operator's errors. Perfect accessibility for fast loading and unloading.



One of the two control cams carried by the feed unit sequence plate.

CROWNING

Gears being shaved conventionally can be crowned by rocking the table about a central pivot during the automatic cycle. The cam controlling the rocking movement is located on table centerline to avoid any tendency to twist. This device also provides for taper shaving.



1. Crowning cam and bracket.
2. Locks for diagonal shaving adjust.
3. Locks for diagonal shaving adjust.
4. One of 2 tapered shot bolts used to realign table and work for conventional shaving.
5. Lock pins which, when removed, permit table to rock for conventional crowning.
6. Bolts operated from the front of the machine actuate tapered wedges to lock table in the work.

Write for Bulletin S53-7 for full details.

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WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

BUSINESS TRENDS

U.S. FARM POLICY finally is taking shape. The administration will continue price supports for crops. But a better all-around program is being devised. Extremely high production, loss of foreign markets, a drop in prices, lower farm income, and mounting surpluses are forcing the government to act.

U.S. is now unloading $250-million of agricultural surpluses in foreign countries. Overseas nations pay local currencies. Then this country spends the foreign exchange received, for military and economic assistance abroad.

Generally, the nation purchasing the commodity gets the aid. However, the Foreign Operations Administration, which handles the program, has worked out triangular deals whereby a currency can be spent in a third country.

Cotton, tobacco, corn, wheat, beef, dairy products, fruits, fats, oils, and oilseeds are the ten items bought from the farmer for overseas distribution. European nations eligible for the crops are Belgium, Denmark, England, France, Germany, Greece, Netherlands, Norway, Spain, and Yugoslavia. U.S. will spend about $50-million for aid in Central America, Far East, and Middle East as a result of the triangular transactions.

DIVIDEND PAYMENTS of American corporations will reach a new peak in 1953. Stockholders will receive $9.5-billion, a 4% gain over 1952. Furthermore, this high rate will be sustained in the first half of next year.

Transportation-equipment manufacturers will lead all industries, boosting dividend outlays by 20% in 1953. Railroads, machinery manufacturers, and chemical producers also will substantially increase payments to stockholders. Profits of chemical companies will rise 14% for the year.

Most companies will remain in a healthy position to cover dividend requirements because of abandonment of the excess profits tax on January 1. That includes the steel and railroad firms, whose earnings are certain to slide in 1954. Food, utility, aircraft and finance corporations will chalk up the best profits next year.

As in 1953, the durable-goods lines will suffer the worst adjustments. Many of these companies will be forced to curtail overhead expenses and reduce prices to earn enough to pay dividends Textile and leather-products concerns will trim payments further.

U.S. EXPORTS are being sold abroad in increasing quantity through triangular transactions. These involve so-called switch deals in which an importer abroad buys American goods against payment of excess balances of a third nation's exchange. A clearing agreement is arranged in advance between the importing country and the third nation.

The exporter here receives dollar payments from an exchange broker after paying him a commission. Another party in the U.S., who buys goods from abroad, pays the dollars to the broker.

The third country, which provides the merchandise to the American importer, takes credit for the excess balance of the original importing nation. Here is a common transaction:

A businessman in Finland wanted a shipment of U.S. machinery. His country had large peso balances in a Buenos Aires bank accumulated from sales of Finnish pulp to Argentina. An American importer needed to pay for a shipment of Argentine wool. The New York exchange trader found the importer and sold him the pesos for dollars, which were turned over to the machinery exporter. In Argentina, the bank debited Finland's peso balance.

Switch deals are now at a 25-year peak. Nearly one-third of all world trade is operated on this basis. Western Europe, especially Holland, gets its share of three-way deals.

But success in triangular trade transactions always depends on having the desired commodity unavailable in a country short of dollars. The product sold must be fully competitive in foreign markets so that an exporter can increase his price by a margin sufficient to cover the discount paid to the exchange broker.

MANUFACTURING INDUSTRIES in the U.S., according to McGraw-Hill survey, plan to spend in 1954 nearly as much (within 8%) for new plants and equipment as they spent in this all-time record year of 1953. This promises continued prosperity. For a complete forecast of U.S. business conditions, see our January issue.

The small decline will be mostly the result of completion of defense expansion programs. There is no evidence of widespread cutbacks in anticipation of a recession. The steel industry shows the largest drop planned in capital spending, and automotive the largest increase. Trends in machinery field are diverse—some up, some down. We have more information if you need it.

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Typical of demanding off-highway hauling: harvesting sugar cane with model R-160-4x4.

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WASHINGTON REPORT

U. S. COMMERCIAL EXPORTS, according to estimates of government officials, will rise from about $12.2-billion in 1953 to $13-billion in 1954, plus or minus $100-million. They believe also that imports will hold steady between $10.5-billion and 11-billion. The dollar gap on current account will widen. That slow reserve accumulation abroad, but not foreign buying in the U. S.

Foreign gold and dollar reserves should increase more than $2-billion in 1954, compared with $2.5-billion expected this year. Reason: continued rising U. S. military spending abroad for offshore procurement, troop pay, other expenses. Military spending, excluding arms shipments, is running at an annual rate of about $2.5-billion. Nearly $3-billion worth of offshore procurement contracts alone are now outstanding, compared with $780-million in June 1952.

The greater military spending will more than compensate for sagging economic aid, which now is down to an annual rate of $1.2-billion, compared with a rate of nearly $2-billion 6 months ago. The U. S. government's being close to the legal debt ceiling will slow economic-aid payments further during at least the next 6 months.

The pattern of reserve accumulation will vary from area to area. The sterling area will not gain much over-all because of the slump in rubber and tin. Western Europe, particularly Germany and Holland, will make substantial dollar profits. Latin-American showing will vary from country to country and will not change much in balance.

Commodity shifts in the U. S. trade picture next year will look like this: Nonferrous metals, rubber, wool will drop some on the import side. Tourism, other invisibles, and manufactured goods will rise. Automobiles and farm machinery will sag on the export side. Capital goods will rise. Agricultural exports should recover slightly under the prod of government subsidies.

U. S. FOREIGN AID next year may look less like aid, according to half a dozen schemes now being considered by Eisenhower's administration. One idea is to take all military aid out of the Mutual Security budget and put it into the regular Defense Department budget. Stassen's Foreign Operations Administration—the old Mutual Security Agency—doesn't like this suggestion. FOA fears it would make economic aid even more vulnerable in Congress by isolating it from the overseas defense program. Congress may not like the proposal either if it ever gets that far. Key congressmen suspect that lumping defense and military-aid budgets might be done to camouflage more aid spending.

There's talk too about merging FOA with the State Department. This would reverse the trend toward getting operating agencies out of State. But FOA is taking on many earmarks of a liquidation operation. Nothing is settled yet, but three things are certain:

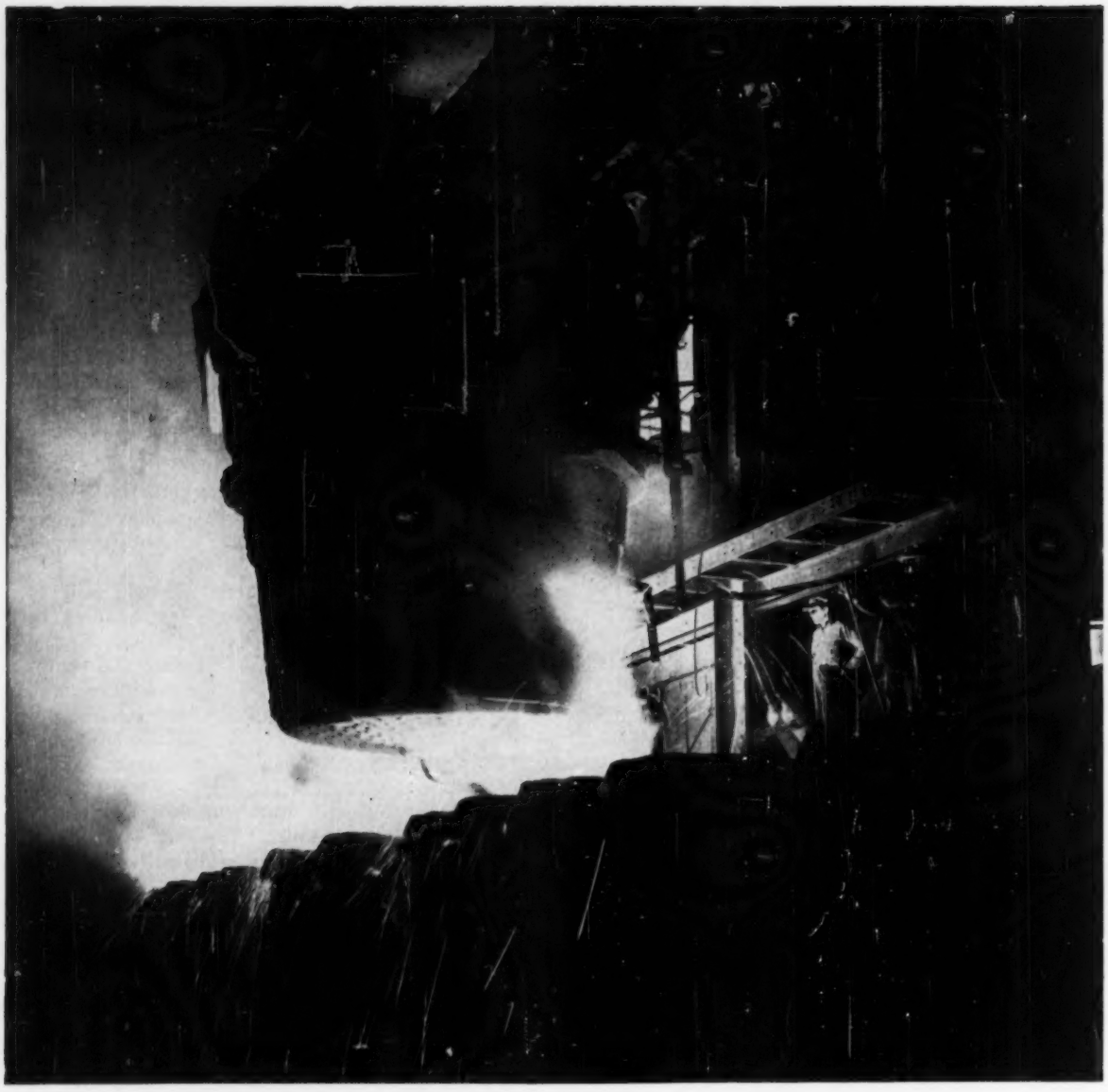
- Military-type aid will be substituted for straight economic aid wherever possible. Foreign budget-support operations like offshore procurement will be pushed.
- Some unvarnished economic aid will still be essential, no matter what agency handles it. Critically needed aid to Austria, South Korea, Iran, Bolivia, Israel, India, Pakistan, and southeast Asia cannot be disguised as military aid. Scrapping these aid programs would mean scrapping U. S. foreign policy—that will not happen.
- Technical assistance will be tied more closely to specific short-run policy goals. It will be used interchangeably with other economic weapons to achieve political results. The old Point-Four, long-range approach has been discarded.

WASHINGTON expects the UN Tin Conference at Geneva to present an international agreement to stabilize the market through production and export controls and an international buffer stock. The U. S. will not sign. Official and business sentiment is less hostile toward the idea now than before the Korean boom, but Washington will not move until the Randall Commission on Foreign Economic Policy reports in March.

NEW TARIFF COMMISSION currently is wrestling with its first major test cases—requests for duty boots on wool and lead. Wool growers are asking for a special fee of 15 cents per lb. on wool imports. Lead miners want duties hiked 50% above 1945 levels.

Decisions in these cases will indicate how the Tariff Commission will swing in the future. The commission now is evenly divided with three high-tariff and three low-tariff members. And the new rules set up by Congress send a tie vote to the President for action.

This tilts the odds sharply in favor of commission recommendations for higher tariffs on specific commodities. The high-tariff bloc in Congress will try to press this advantage next session by giving the commission broad executive powers.



FROM THE BETHLEHEM PLANTS...

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DECEMBER 1953
VOLUME 8 • NUMBER 12

McGRAW-HILL DIGEST

McCARTHY is fighting it

STASSEN—in the middle

CHINA'S MAO needs it badly

Free World–Communist Trade

East-West trade is going up and what to do about it is a ticklish question of U. S. foreign policy. The latest feeling, as laid down in Stassen's report, is to use a more flexible yardstick.—An original Digest article

WESTERN EUROPEAN exports to Red China have been climbing steeply since the turn of the year and are likely to keep on going up. You can read this trend between the lines of Foreign Operation Administrator Harold Stassen's latest report to Congress on East-West trade.

No commodity breakdown is available on the China trade but the over-all export figures show the trend:

Western Europe exported $57-million worth of goods to China in 1950, $44-million in 1952, and $52-million in the first 5 months of this year. At that rate, exports will top $120-million this year—roughly three times last-year's volume.

Exports to Russia and her European satellites from Western Europe, meanwhile, have been sagging. They were $731.3-million last year and are running at the annual rate of $586-million this year. But chemicals still account for a sizeable amount of these exports.

This question of trade with the Soviet empire is one of the most exposed nerves of U.S. foreign policy. A drive to ban all trade with Communist China and to toughen the embargo against the rest of the Soviet bloc is continuing in Congress. But political and business pressure on allied governments to relax the free-world embargo on strategic shipments to the East is mounting steadily.

Stassen's report to Congress, because of the opposing political pressures, has long-range significance. He laid down a middle of the road East-West trade policy, stressing that over-all political, economic and military strength of the free-world alliance is more important than isolated trade deals that might help communist nations militarily.

Many U. S. allies depend heavily on foreign trade, Stassen argues, and cannot afford to pass up markets and resources anywhere. So there will be no attempts by the U.S. alone to throttle East-West trade.

The charge that Western strategic controls are cutting allied nations off from vast and profitable Eastern markets is rejected in Stassen's report. The real reason, he claims, for the sharp postwar drop in trade with the East is the Kremlin's drive for an inbred communist economic system—which Russia can manipulate for her lone benefit.

A clear U.S. East-West trade policy emerged from the report:

1. The U.S. will seek allied backing for curbs on strategic trade with the Soviet. But it will use a more flexible yardstick in judging what trade is harmful. Example: President Eisenhower has decided to continue aid to Norway despite the fact that Norway sent over 3,000 tons of aluminum to the Soviet bloc in clear violation of the law that defines the opera-

"The tugging and hauling . . . is bound to go on."

tion of strategic-trade controls. The administration felt that Norway's contribution to the North Atlantic Treaty Organization outweighed the importance of the aluminum deal.

2. The U.S. will not discourage allied trade with the East in nonstrategic goods.

3. U.S. policy makers distinguish between Red China and the rest of the communist bloc. They think Mao desperately needs Western goods—nonstrategic as well as strategic—to carry out his industrial revolution. The U.S. will continue to press for tougher curbs on the China trade until Mao Tse-tung drops his expansionist aims. Pressure on the allies will be diplomatic, and you will see no drastic unilateral action by the U.S.

4. Washington will put more emphasis in the future on enforceing existing controls on East-West trade, less on new controls.

This policy has little that is radically new. But the mere fact that the administration now has taken a clear position should ease the strain on the alliance. Allied fears that the U.S. is being pushed toward a tougher policy by political pressure at home have helped boost the tension between Western Europe and the U.S.

The tugging and hauling over the East-West trade policy is bound to go on. And it is likely to become even more fierce if there is a protracted lull in the cold war. Stassen's figures on the increase in the China trade this year reflect the mounting world-wide pressure to get into the China market.

Allied governments so far have resisted political pressure to scrap strategic controls. But how long they will be able to resist such pressure in a climate of relative international stability is questionable. In the U.S., many congressmen, such as Senator Joseph McCarthy, are almost certain to howl with indignation when they see the rising curve of allied trade with China. They will fight any move to relax strategic controls.

Stassen's report had some racy "cloak and dagger" prose in it as well as high policy. Examples:

A posse of Thai police waited in the dripping jungle dawn on the Thailand-Laos frontier. An automobile churned toward them along the mud-mired road. The posse opened fire. The four occupants of the car surrendered. In the back of the car were two bazookas, a mortar, a Colt-Smith gun, seven grenades, two complete field transmitters and a receiving set—bound for Ho Chi Minh's communist guerillas in Indochina.

About the same time, a British Navy patrol boat prowling through the Lamma Channel off Hong Kong sighted two suspicious looking vessels. One of them, a PT-type craft, made a dash for the China coast. The British opened fire, and the boat hove to. Its hold contained 317 boxes of paraffin wax, 670 boxes of tinplate, 256 bundles of hoop steel, 107 bundles of galvanized iron sheets—all highly strategic materials.

In Copenhagen, a few months earlier, a cargo declared to be alloy steel was being unloaded for transhipment to Rotterdam. One case toppled to the wharf and broke open. The Danish port official immediately ordered confiscation of the whole cargo. The shipment was high-grade nickel used in gun barrels and ammunition, not alloy steel, which is of much less strategic importance. Police of four nations now are working on the case on the suspicion that the nickel was bound behind the Iron Curtain.

Bank Trains Its Tellers and . . .

. . . Clerks with Model Bank

New York City's National City Bank decided that it should not use its customers for the training of its new employees. So the bank set up a Training Center, which is really a fully equipped model of a bank. There the employees can learn by doing, until they know their jobs. Each week the center graduates about 75 tellers, junior clerks, file clerks, adding machine operators, typists, and bookkeepers. Courses last from one to four weeks, depending on the needs of the job.—Business Wk, Oct 10, p68

CHEERS WENT UP from Premier Yoshida, center with glove and cigar, after last spring's election. But it's not an easy job to . . .

RAISE LIVING STANDARDS against all kinds of odds; that's why . . .

Japan Is Asia's Unknown

Japan's Economic Council Board has some sobering facts on the economic health of Japan but the medicine prescribed is bitter indeed.—An original Digest article

TOKYO—Japan is Asia's unknown economic factor. Potentially, the country is the workshop from which non-communist Asians could draw the tools they need for economic development. But Japan, despite all its talk to the contrary, has not made up its mind what it is going to do to get down seriously to business.

Japan persists in following short-term economic policies, enjoying an unreal prosperity almost entirely based on United States military spending. Per capita consumption recently surpassed prewar levels. Foreign trade, still below half of the 1934-36 average, is falling off and the deficit in merchandise trade is rising.

During the calendar year coming to a close, Japan will have imported almost $1-billion more than it exported. Foreign-exchange reserves, built up largely out of invisible U. S. payments of $750-million annually for supplies used in Korea and Japan and for recreation of American troops, will fall below $800-million from a recent high of $1.2-billion.

Economists warn that this cannot go on forever. They point to a developing combination of unfavorable factors: increasing population, decreasing special American expenditures, limited domestic supplies of food and industrial raw materials, inefficient production facilities and managerial organization, and expanding competition from other industrial nations for "narrowing" foreign markets.

They recommend strict adherence to an austerity program with economic reserves that could be accumulated now, saved for use in future lean years, and invested in capital equipment to improve Japan's productivity.

Few persons disagree with this analysis. But it seems that nothing will be done about it until Japan is in a tight economic spot, when foreign-exchange reserves fall below $300-million. Businessmen like the profitable boom in the domestic market and dislike facing the hard tasks of building foreign trade. They have convinced themselves that the U. S. thinks Japan so important to America's defense that it will continue underwriting Japan's economic frivolities.

They were delighted and reassured by a U. S. State Department announcement last spring to the effect that U. S. expenditures would be maintained at a "relatively high level" for the next 2 years, and that, if a serious situation should develop in Japan's economy, U. S. officials would want to discuss with Japanese officials ways in which the U. S. government should help.

Business also dreams of trading with Communist China and hopes to perform this feat while continuing to be serviced out of America's purse.

The Japanese government welcomes this attitude. In a precarious political position in the Diet, neither Prime Minister Yoshida nor other conservative leaders

wish to rock Japan by decreeing austerity of any sort. Only under strong pressure from business would the conservative parties amalgamate behind a tough policy of export first, saving and investment second, and consumption last.

To forestall such a serious predicament, the government has sought to write an economic safety clause, firming up U. S. economic commitments, into the Mutual Security Agreement. In the Japanese view, economics must come ahead of defense commitments.

Extremists Speak Up

About the only dissident voices are those of Japanese extremists. Labor, under communist inspiration, complains that it is not getting a "fair share" of the present high living. It thinks business could cut luxury spending and raise wages. It wants no part of belt-tightening, productivity drives (called rationalization here), which might bring unemployment and job dislocation.

Ultra-nationalists support an austerity program for everyone coupled with strong-arm rule to make the country powerful—thus free from all foreign influence and domination. They believe Japan has a manifest destiny and, if the government will only follow an independent line, Japan's sun will rise again.

In a recent economic White Paper, the Prime Minister's Economic Council Board (ECB) analyzed current developments and summarized problems in Japan's efforts to achieve self-support status. The long look included visions of:

A continuing direct drain upon Japan will include reparations, interest and principal payments on foreign debts and loans, and expenditures for the new Japanese Army, Navy, and Air Force. Reparations are still unsettled; while recipients are making unrealistic demands, some substantial settlement seems to be necessary to overcome anti-Japanese sentiment, which has limiting effects upon trade. As ECB says, "The burdens of self-defense will not be light."

Population now is nearly 87-million—close to 30% above prewar. The annual natural rate of increase is 1.5%, so the people of Japan will number 90-million by the end of 1956 and over 100-million by 1970. Feeding and clothing the increased number of people will cost at least $40-million more each year.

A tougher problem is handling the increase in employables. The employable-age group increased a net 1.2-million this year. Not all want jobs, but most do. Increasing the volume of employment means decreasing productivity at the time when a rise in productivity is necessary.

Based on current prices, Japan exported $4-billion worth of goods prewar. Today, foreign-exchange receipts, including merchandise exports and special American spending, are only 45% as much. About 25% of the loss is geographical: the elimination of trade with Manchuria and China, and the limitation of trade with independent Formosa and Korea. Another 10% cut comes from the drop in silk exports.

Development of light industries in countries, which before World War II bought consumers goods from Japan, slashed trade another 20%. Cotton-textile exports illustrate this, having dropped to 1-billion yards from 2-billion. Unless there is great improvement in Japanese industry or new markets, the maximum limit of merchandise export recovery is calculated at 40% of prewar or $1.6-billion.

Squeeze on Exports

High prices of capital and chemical goods on the one hand, and rapidly expanding consumer purchasing power on the other, combine to restrict exports. All production costs are high because of low productivity of obsolescent equipment, inefficient use of power, lack of quality supervision and labor management techniques (so highly developed in Japan's major competitors), high raw-materials costs, interest payments, and uneconomic utilization of excess production capacity.

Rising consumer purchasing power created ready markets at home for consumer goods of all kinds at high prices, so manufacturers were under no compulsion to lower costs and prices. In 1952, consumer purchasing power was up $1.7-billion, or 20% from 1951. Current year's increase promises to be of the same order. Add to this an increase in national finance of $550-million to $1.1-billion in advances from government banks and agencies to commercial firms, and it is not difficult to see why production increases and foreign trade decreases. Twice during the last year taxes were reduced and a third cut is in the offing.

Two Possible Solutions

ECB looks at Japan's problem two ways. One is to seek new and to expand old markets. The second is to increase self-sufficiency.

Trade hopes center on underdeveloped countries and Communist China. Southeast Asia is one open area, but there Japan faces stiff competition from Britain and other European exporters. Japan would like to see a rapid expansion of investment throughout the region on such a scale that there would be increased demand for goods from all manufacturing countries. But, barring a drastic change in U. S. investment policy, the Japanese see little hope of any such expansion.

China trade, now banned by agreements with the U. S., is a perpetual attraction for Japanese businessmen. They remember bygone days when Japanese bayonets and special interests backed up their commercial activities in Manchuria and North China. While things are different now with the Communists in control, they believe "business is business," and trade should be prosperous. But Japan will have to compete with other exporters for the China market as it must compete in southeast Asia or receive some favored nation treatment from Red China. The latter obviously would be conditioned on pro-communist policies in Japan.

On the cost-cutting problem, ECB states that production must

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be concentrated in the most efficient plants, with inefficient plants and surplus labor disposed of. But it notes that there are "social restraints" to be overcome.

The Board has outlined some of the investment requirements for cutting industrial costs and increasing self-sufficiency, with the goal of making Japan self-supporting in 1957. It calls over-all for investment of $5.8-billion, with over half to be supplied by the government. It estimates that this would raise the national income 20% from 1952's $15-billion to $18.2-billion in 1957. Exports would be up $1.6-billion and imports down to $1.6-billion from 1952's $1.9-billion.

Agriculture would receive the largest government support of $1.2-billion. This expenditure for land reclamation, irrigation, and farm improvement would provide enough food for the population increase and enable Japan to cut imports in 1957 by $140-million. After that, presumably, the food import requirements would begin to increase at the rate of $40-million per year.

Electric power is scheduled to receive the second largest government contribution and should receive the largest over-all investment. It is calculated that $2.1-billion spent by 1957 would increase power generating capacity by 5.5-million kw.

Shipping expansion, financed by $637-million, should save $90-million annually in freight charges.

Iron and steel industry, on paper, will receive $437-million for equipment to cut pig-iron costs by 4%, steel bars by 12%, thick plates by 20%, and thin plate by 27%.

Coal costs would be cut by 20%, following investment of $408-million.

Chemical-fiber expansion from 8-million lb. annually to 150-million lb. could cut wool and cotton imports some $150-million. The investment required is figured at $120-million.

Metal-working industries need $350-million, and fertilizer $56-million for modernization.

Raising these investment funds create a dilemma for Japan in its present psychological framework. If the money comes principally from inflationary sources, the net effect will be far short of the goals ECB considers desirable. Current taxes at 21% of national income, compared with 13% prewar, are considered onerous and are reported to obstruct private capital formation. Recent tax reductions, however, did not bring about increases in savings and investment. Rather these savings went into increased consumption.

The ratio of exports to domestic consumption for seven major products—cotton textiles, wool textiles, rayon textiles, raw silk, cement, ammonium sulphate, and steel ingots and bars—was 27 to 73 in 1950, 25.5 to 74.5 in 1951, and 21 to 79 in 1952. The 1953 figures will reveal further declines in export percentages.

In its conclusions, ECB stated:

"It is fully apparent that the Japanese economy is maintaining an economic level far beyond the real capacity which normal trade permits. . . . If this is understood, rich people should refrain from leading a life of luxury, businessmen should avoid corporation consumption (high overhead, expensive entertainment), and workers should refrain from insisting on wage hikes beyond the rise in productivity. . . . To maintain the present domestic business activities and to strengthen the competitive power for exports is contradictory. . . . It would need an operation, instead of a progressive transformation. In fact, it means laborers and farmers and businessmen must suffer now to accomplish a recuperation.

"But it is difficult to get a patient's consent to a painful operation when the symptoms are so obscure and the torment seemingly remote; but when foreign-exchange reserves are exhausted and no other means are left but a drastic operation, it will be too late.

"Unresolved while strong enough to stand an operation, too weak to undergo it as the final treatment for the worst conditions, that is the serious contradiction confronting Japanese economy."

A more recent study, completed by the Prime Minister's Resources Investigation Council, found that Japan would need "another Kyushu" within 10 years or so if the present living standards are to be maintained. Kyushu is Japan's southern-most main island. Its duplication would be the most unlikely miracle. But then Japanese are certain some unreal event will rescue them before they have to face reality.

Another Automobile of Tomorrow

Hudson's experimental car, the Italia, is a small automobile—10 in. lower than the standard Hudson and with a 104 in. wheelbase. It has three significant body features—door opening into the roof, air scoops in the fenders just above the headlights, and rear lights placed in a triple bank of chromium tubes. The Italia has two separate front seats with reclined backs, shaped contours, and safety belts.—Prod Eng, Oct, p205

Freedom from Lint Is Key to Good Knitting

Circular-rib machines accumulate more lint than other knitting machines. Lint eventually gets dragged into the needles and damages the needles or spoils the cloth.

Piedmont Fabrics, Inc., has started a cleaning and oiling program that has cut its seconds down to practically zero. Secret of its good-quality cloth lies in the hands of Piedmont's knitter and in a Scott & Williams automatic cleaning units attached to each machine.

The unit is fixed to the top bed plate and functions through the mill's air-supply line to direct a blast of air at the needles and the bottom stop motion. A timing control blows off lint for a few seconds at 2-in. intervals.

The knitter blows off the needle slots on the front of the machine that are untouched by the cleaning unit's air blast. The knitter also directs the air hose at the bottom stop motion, the bobbin stand, and the top motion.

Needle oiling is done as each roll of fabric is taken from the machine. Sufficient oil gets to the needle latches and butts to do a good job of lubrication.—Textile World, Sept, p179

Silver-Brazing Rejects

To reduce a rejection rate of 25% on silver brazing of tungsten-carbide inserts to stainless-steel caps of spray nozzles, Spraying Systems, Inc., had to get carbide surfaces completely free of scale. Otherwise, the silver alloy would not flow properly and the braze would be poor.

Wet blasting, which consists of hurling water-suspended abrasives at high velocity upon the work by compressed air, gave the required scale-free surface. The inserts, ½ in. in dia. and $\frac{3}{16}$ in. thick, are strung on wire and blasted, with 325-mesh abrasive, for 45 sec. in a wet-blast cabinet made by American Wheelabrator & Equipment Co.

Inserts are rinsed and dried before brazing. Brazed assemblies are given a short blast to remove discoloration.—Weld Eng, Sept, p62

A Digest Index

On pages 59 to 64, you'll find an index of the material published this year in the McGraw-Hill Digest. From now on, this new feature will be in every December issue because so many of you have asked us to start an annual index. You'll find this index of particular value if you file your Digest copies. It will enable you to refer quickly to published material to get the information you may need.

One word of caution—please do not refer to this index and then ask us for copies of the original articles; they are not available. The great demand for original articles exhausts our supply within a few months after each issue of the Digest is mailed to you.

Non-Electrolytic Process Makes Hydrogen Peroxide

Lower prices for hydrogen peroxide may be the end result of E. I. du Pont de Nemours & Co., Inc.'s method of making non-electrolytic peroxide. During World War II, Germany's I. G. Farben developed an anthraquinone process that made a metric ton per day. Du Pont has now improved this process.

The new method uses a mixture of aklylated and tetrahydro alkylated anthraquinones and a solvent mixture of primary or secondary nonyl alcohols with mono- or dimethylnaphthalene. The first shipment of hydrogen peroxide made this way rolled out of Du Pont's new Memphis plant in August.

Other companies are watching closely. Buffalo Electro-Chemical Co. has patented one non-electrolytic process and is working on another. Mathieson tried one in the early 1940's and abandoned it because of its high cost and inefficiency. Shell Chemical and Pennsalt are interested.

Why all the interest? A $12-million payoff for hydrogen peroxide for: textile bleaching, pulp and paper bleaching, rocket and torpedo propulsion, manufacture of other peroxides, carroting of furs in felt manufacture, disinfectants, foaming agents, mouthwashes, laboratory reagents.—Chem Wk, Aug 15, p80

Window Welding Saves Blistered Boiler Tubes

Window welding is probably the best way to repair blistered boiler tubes permanently. It is quick and as easy as building-up or putting on a lap seam—and these usually do not last long, even under normal boiler operating conditions.

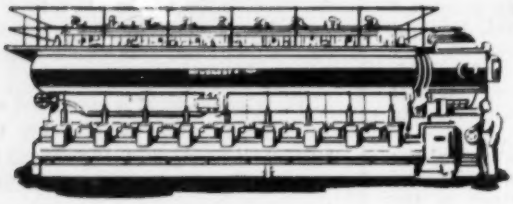
To window-weld a tube, cut out the bulged area, square off the tube ends and grind a 30° angle all around on the inside. Cut a new piece of tube to fit and grind each end of it the same way.

Since other tubes are probably too close to permit welding all around the outside, it must be welded on the inside. To do this, cut out a semicircular piece from each end of the replacement piece. Put the section in place and weld through the opening or windows. To finish the job, put the semicircular windows back into place and weld them solid from the outside.—Power, Oct, p150

Pipeline Planning Is Easy

Average city's gas distribution system—a network of small pipelines—is complex. Analyzer pictured is designed to solve distribution problems. Flow of electric current through the machine corresponds to the flow of gas through the pipeline network. An engineer running the analyzer can work out problems that nobody ever tried before except by guesswork. Its official name is the McIlroy Pipeline Network Analyzer. It was developed by Dr. Malcolm S. McIlroy, Cornell University's College of Engineering. —Business Wk, Sept 19, p174

WHEN YOU THINK OF POWER



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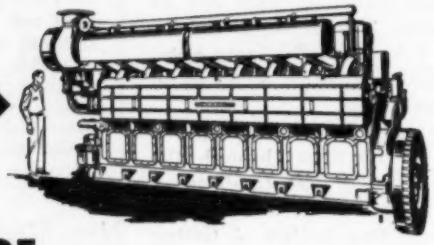

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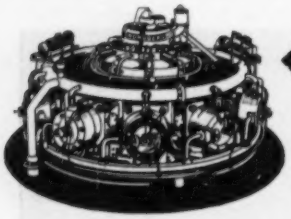

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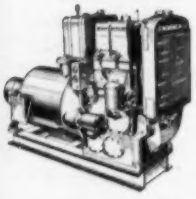

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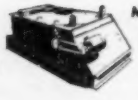

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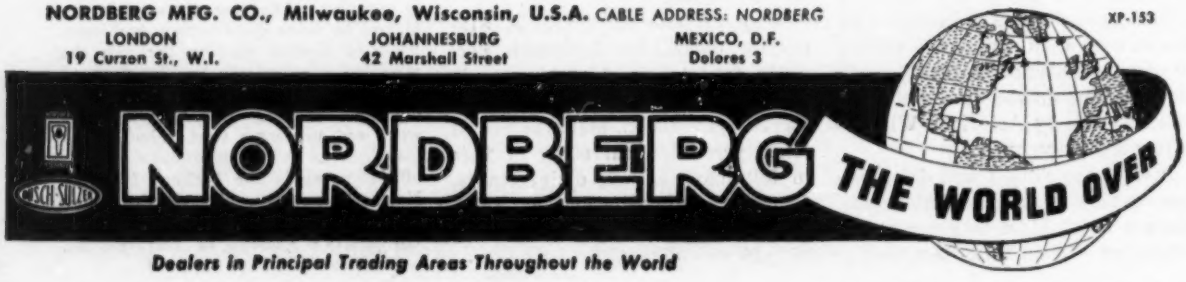


Dealers in Principal Trading Areas Throughout the World

This Month's How To . . .

. . . make workers safety-minded

At Scott Paper Co. last year, the safety record was only nine lost-time accidents among 2,177 employees. Credit for this fine record should go to the ideas worked out to keep interest alive.

Here are some of them: a safety flag at the plant entrance that is taken down for 3 days after each lost-time accident; a shield posted everywhere that says, "Think—Work—Talk Safety;" match books with safety covers; desk pads with safety slogans; safety posters on bulletin boards; and many other promotion stunts.

One such stunt is to emphasize safety to new employees by driving a nail into wood, using safety glasses as a hammer. Another is a beautifully made glass eye that speaks for itself.—Paper Ind, Sept, p662

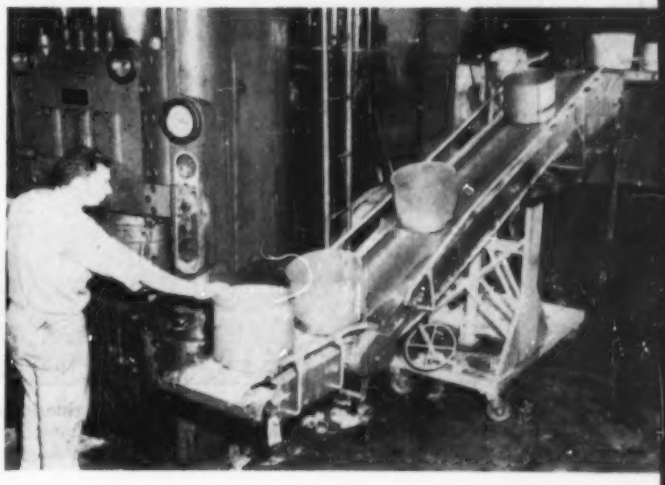
. . . guard against port pilferage

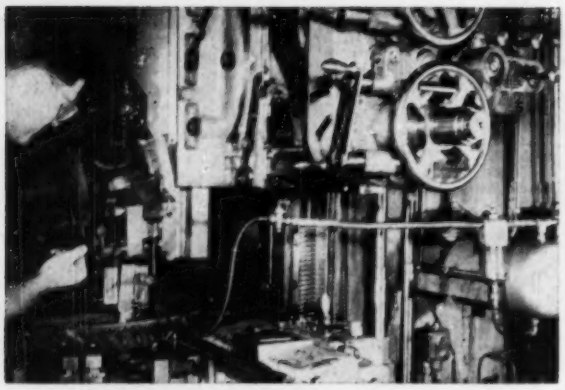
Transportainer is the name Dravo Corp. of Pittsburgh has come up with for the welded steel container it has developed to protect goods from damage and pilferage during shipment. Above, one of them arrives at Casablanca, North Africa. This model, with a capacity of 275 cu. ft., is being used by Natural-Nydegger Transport Corp., New York freight forwarder, to tranship goods from Switzerland to North Africa. Locked and sealed, the container insures safe arrival of goods at their destination.—Business Wk, Sept 19, p168

. . . reduce breakage in pottery plant

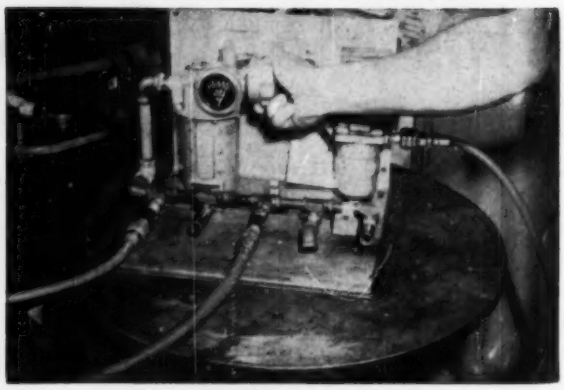
Less breakage, reduced loading time, and a labor savings are the benefits Cleveland Pottery Co. is gaining from this aluminum belt conveyor. It is a lightweight, portable, self-powered unit made by Rapids-Standard Co., Grand Rapids, Mich.

The conveyor can be easily moved to convenient positions for loading and unloading vehicles or for tying it into production lines, as here shown. Wooden strips placed under belt edges create a trough that prevents ware from rolling or sliding off; even the most fragile ware can be handled safely.—Ceramic Ind, Oct, p61



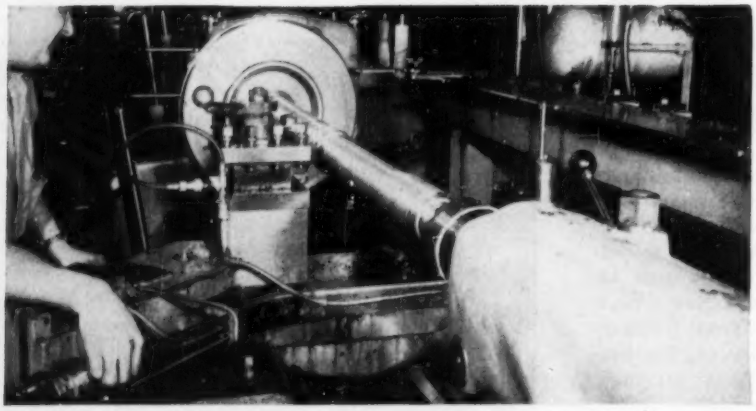


STAINLESS-STEEL nozzle diaphragm for jet engine is faced, turned, and bored at 52 rpm. and 0.009 in.-per-rev. (ipr.) feed. Mist cooling is supplied by Acro unit at right.

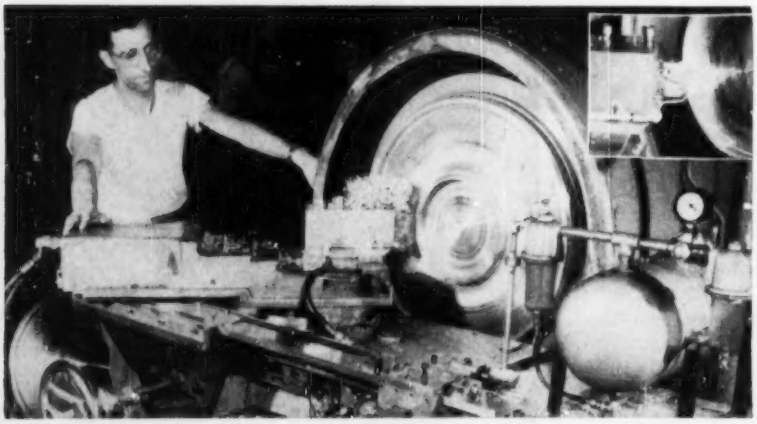


PORTABLE Alemite Oil-Mist injector was arranged at General Motor Corp.'s Allison Div. with manifold to allow tests to be run on five machines simultaneously.

Oil Mist Cools Cutting Tools



JET-TURBINE SHAFTS, forged at SAE 4340 steel of 285 to 321 Brinell hardness, are rough-turned at Studebaker Corp. in two 3/32-in.-deep passes at 196 rpm. and 0.022-ipr. feed. Nozzle is directed up between tool and work.



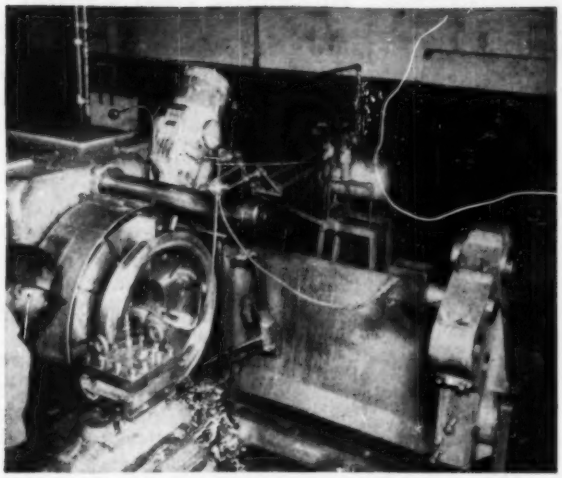
ALUMINUM-alloy compressor wheel for jet engine is contour-faced at Studebaker at 500 rpm. and 0.008-ipr. feed. Inset shows nozzle fed through tube clamped to slide. Injector vaporizes 24:1 water solution of Acro-Coolant.

MIST COOLING is the spraying of a cloud of compressed air and atomized fluid to cool a metal-working operation. Although it has long been effective in some special operations, such as routing of aluminum-alloy sheet, wide-spread use is a fairly new development.

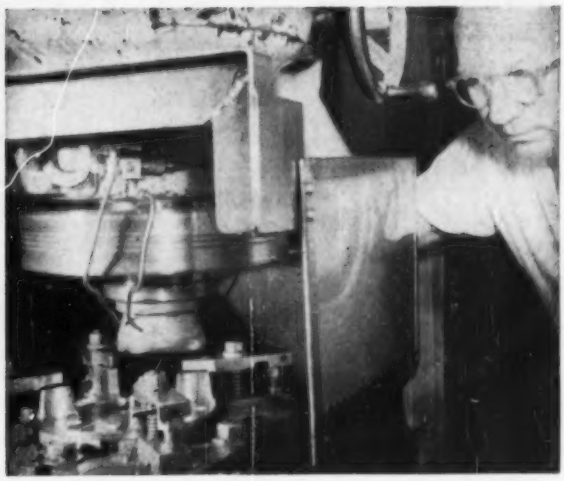
Spray systems have replaced a number of flood systems on lathes, boring mills, milling machines, high-speed saws, drillpresses, and grinders. Advantages include better working conditions, increased tool life, and less heat distortion of work pieces. Mist cooling eliminates the cost of frequent cleaning of pumps, pump repairs, and coolant reclamation.

The method has not been found suitable on some types of machines. Nor is it satisfactory when cuts are heavy or when a number of tools are cutting at one time and generating a considerable amount of heat. A definite disadvantage is the danger of blowing chips and abrasive particles into slideways and bearings.

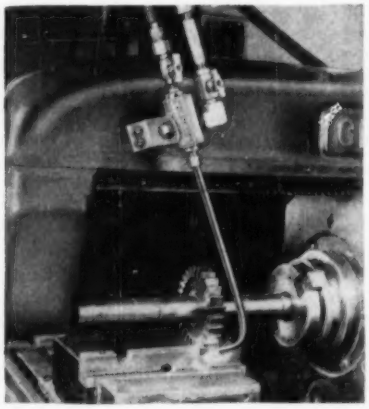
Several types of injectors are on the market. Stewart Warner Corp.'s Alemite Oil-Mist lubricator, Air Conversion Research Corp.'s Acro Lo-Jet, C. A. Norgren Co.'s Oil-Fog system, and Henry G. Thompson & Son Co.'s Milford Atom-Lube spray unit are among those applied to mist cooling.—Am Mach, Sept 14, p137



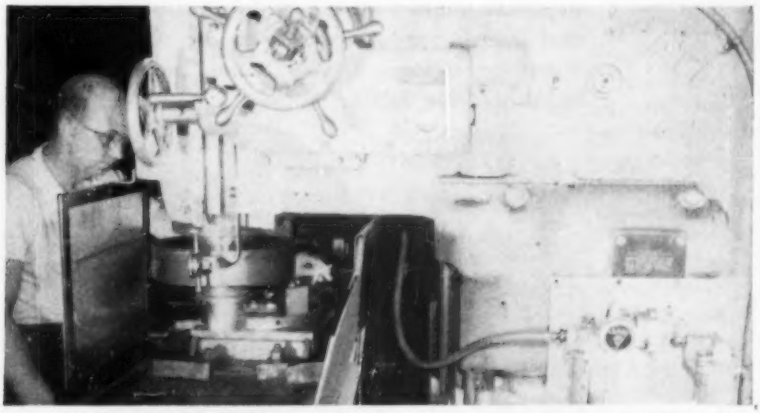
TWO ACRO LUBRICATORS are mounted on Lo-Jet injector so full spray volume can be fed simultaneously to tool on carriage and one on turret while finishing turbin-wheel rings. Injector delivers 6 gal. of coolant in 8-hr.



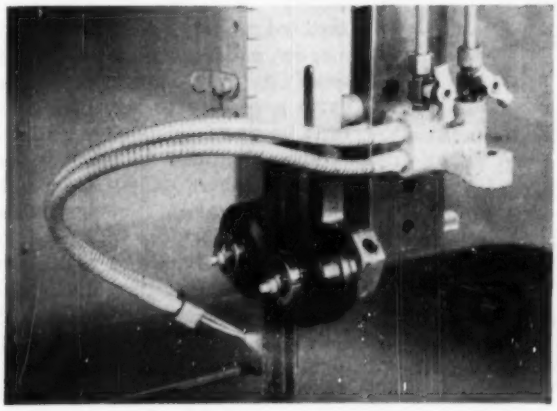
FOUR COPPER TUBES form nozzles in spray-cooling system on vertical miller in which a carbide cutter machines transmission forging. Mist cooling doubled cutter life between grinds, stopped cracking of carbide bits.



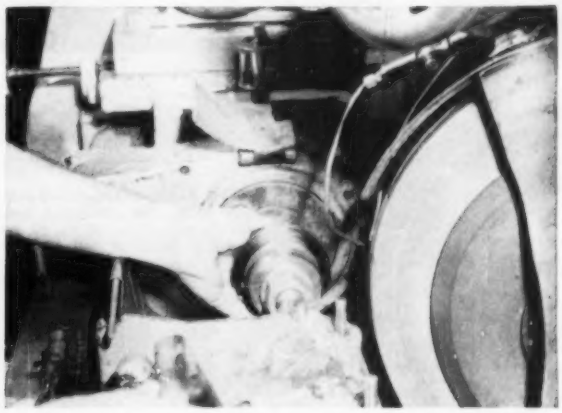
MILFORD Atom-Lube spray head, here applied to milling job, mixes coolant and air with a venturi tube.



OIL-MIST SPRAY COOLING on vertical milling machine doubled both tool life and production rate and improved surface finish of product. Job was the roughing and finishing of four pockets in a forged SAE 4340 transmission part.



MIST COOLING of DoAll saw blade increased blade life five times over dry cutting on aluminum strip. Speed was 3,000 rpm. Lubricant was applied at 120 drops per min.



TWO NOZZLES, fed from Oil-Mist injector, cool vitrified, 180-grit aluminum-oxide wheel removing 0.0001 to 0.0002 in. of stock with surface finish of 1 to 1.7 mu.-in. rms.

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How to Keep Up With Automatic Food Control

In a list of predictions for the food industry during the next 25 years, *Food Engineering* offered four steps it considers essential for keeping up with the growing interest in automatic process control.

First and foremost, an instrument department or group must be set up in every food plant and assigned solely to study food process instrumentation.

Second step is an organized review of all current processes by this group with an eye toward applying robot devices to take full advantage of automatic control. Interesting and completely new processes may result from this unique appraisal.

Third, specific new instruments and devices may have to be developed to handle your particular product or match your process. The instrument group must be given free reign and money to do this work.

Finally, the findings of this engineering group must be put to work in a program of modernization.—Food Eng, Oct, p100

In-Plant Feeding Solved

Shure Brothers, Inc., Chicago, had the usual problem of providing an attractive and low-cost eating place for employees in a tight labor area. First it hired a concessionaire to operate the cafeteria. The idea did not work. Improper selection of foods, lack of variety, plus lack of experience resulted in fewer and fewer employees making use of the facilities. Company subsidization became necessary to keep the cafeteria going.

Something had to be done. So Shure Brothers called in an outside organization, Cooper Industrial Food Service, Inc., to take over completely. Employees were consulted in determining the cafeteria's color scheme, floor covering, and furnishings. Employee reaction was enthusiastic. The response in terms of food sales was rapid and, employee participation rose to the 95% mark. —Am Business, Sept, p47

Aircraft Signal Runs Airfield Lighting

Three pulses from the radio in an airliner will activate field lighting at Kingman Municipal Airport at Kingman, Ariz. As the pilot approaches the dark field, he presses his microphone button three times at ½-sec. intervals and the field lights are automatically turned on. Five similar signals extinguish the lights.

The new system is saving Kingman manpower. At the same time, it assures the pilot of lighting at any time despite the hour of arrival.

Made by Wilcox Electric Corp. of Kansas City, Mo., it is operated by a carrier-controlled relay unit and associated equipment operating with the squelch circuit of the uhf. receiver on planes using the field. The receiver squelch circuit control is adjustable to operate the carrier-control relay and associated equipment, consisting mainly of a stronger unit and numerous relays used to actuate the lights.

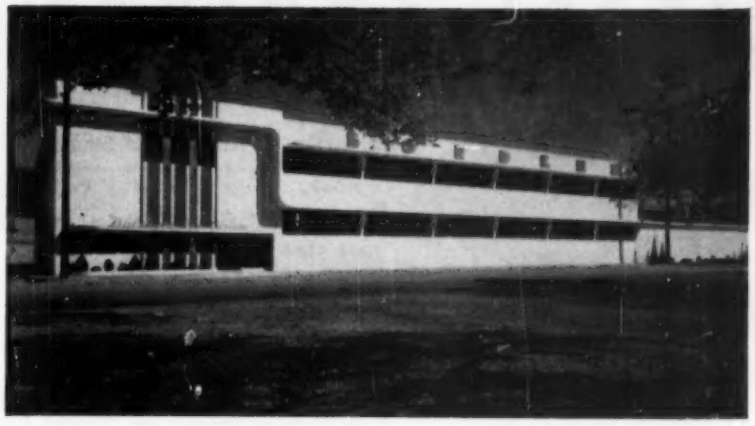
The device has several safety features that prevent it from responding to anything but its predetermined signal pattern and is fully protected against tripping by lightning or static.—Elec West, Aug, p97

Product-Design Shorts

▶ **Proper alloy selection,** heat treatment, and surface coating increase wear resistance of magnesium. Tin, lead, and cadmium-lead are the best alloys. Dow Chemical Co. has found that magnesium bearings can be used directly without bushings or inserted bearings.—p5

▶ **Insulating coating,** sprayed onto a metal surface like paint, can withstand 5000° F. temperatures. B. F. Goodrich Co. makes the coating.—p7

▶ **Stronger rubber** is made by a compounding process developed by Canada's National Research Council in Ottawa. Adding lignin, litharge, brown lead, red lead, copper oxide, and bismuth trioxide increases tensile strength to over 5,000 lb. per sq. in.—Prod Eng, Oct, p7



THIS PLANT was built in 1947 and in 1978 it will still be up to date

Food Plant of the Future

Tomorrow's food plant will be largely automatic and have many cost-saving features. Actually it could be built now—everything is available

HERE IS OUR quick concept of food manufacturing operations in the food plant of the future. It does not include anything that does not exist somewhere in the food industry. It is a matter of bringing it all under one roof.

Automatic Operation—With but a few exceptions, processing and packaging lines will not have workers stationed along them. All operations will be automatic. One exception—it should hold for some years yet—is the product preparation phase of lines processing vegetables and fruits. No one has yet, for instance, found a way of trimming defective spots off tomatoes.

Television receivers and two-way radio communications will be commonplace and indispensable to the highly trained food experts of tomorrow's plants.

Buildings—As in other industries, the trend is to one-story food plants. Multi-story buildings no longer have a gravity-flow advantage. Mechanized and pneumatic movers do the job faster and better. The one-story plant will have a mezzanine for certain operations and a tower for storing bulk materials.

Outside, the structure will have simple, graceful lines with long rows of continuous window space. Inside, the plant will have broad floor expanses without roof-supporting columns. This open area will allow great flexibility of lines and permit easy expansion. Quantities of sheet aluminum, plastic, and metal-clad plywood will make the food plant of tomorrow brighter and easier to keep sanitary. Windows will be set in corrosion-proof sashes, and where they face the sun, they will be tinted to eliminate glare and heat.

Lighting and Power—At least two kinds of lamps will be used widely—ultraviolet and fluorescent. Ultraviolets will produce bactericidal wave-lengths for sanitation. The fluorescents will be flush-mounted in ceilings. Work areas should be lighted by 100 ft.-c.

In food plants with low steam requirements, steam will be generated in small packaged boilers (McG-H Digest, Nov, p28) located near principal steam and hot-water demand points. Large plants will have central boiler rooms and turbo-generators to meet both steam and electrical requirements. It could conceivably even sell its excess power to nearby utilities.—Food Eng, Oct, p82

DIESEL ENGINES

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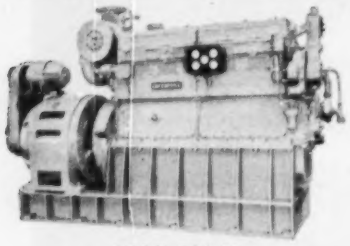
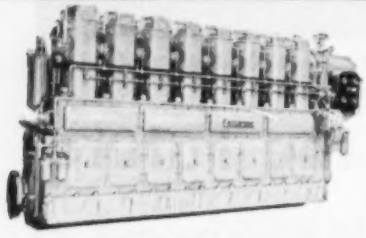


MODEL DSM-36

M Series 8" Bore x 10" Stroke

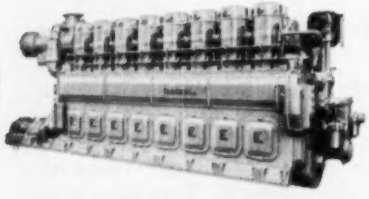
MODEL	HP	RPM	KW*
DMM-3 DSM-3	73-162	450-1000	47-108
DMM-4 DSM-4	97-216	450-1000	63-146
DMM-6 DSM-6	146-324	450-1000	98-222
DMM-36 DSM-36	274-609	450-1000	186-424



MODEL DSG-38

G Series 12" Bore x 15" Stroke

MODEL	HP	RPM	KW*
DMG-6 DSG-6	273-655	250-600	185-456
DMG-36 DSG-36	482-1157	250-600	332-811
DMG-8 DSG-8	364-874	250-600	250-612
DMG-38 DSG-38	643-1542	250-600	445-1084



MODEL DMQ-38

Q Series 16" Bore x 20" Stroke

MODEL	HP	RPM	KW*
DMQ-6 DSQ-6	647-971	250-375	450-682
DMQ-36 DSQ-36	1142-1713	250-375	80: 1210
DMQ-8 DSQ-8	863-1295	250-375	605-908
DMQ-38 DSQ-38	1523-2285	250-375	1068-1624

*Minimum to maximum range at 50 to 60 cycle.

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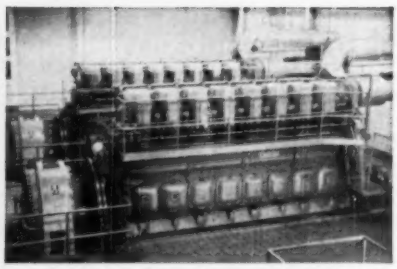


Typical municipal diesel power plant

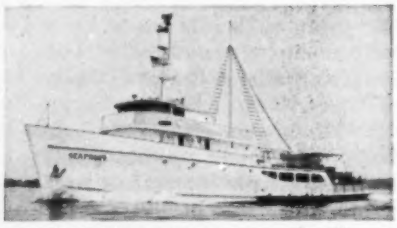
KNOW THE EXTRA VALUES OF ENTERPRISE BEFORE YOU BUY YOUR NEXT DIESEL ENGINE

There's a lot in knowing what goes on behind the scenes that contributes to the overall *long-term value* of a product. Comparison of ratings or the exterior design of two engines may reveal only minor differences.

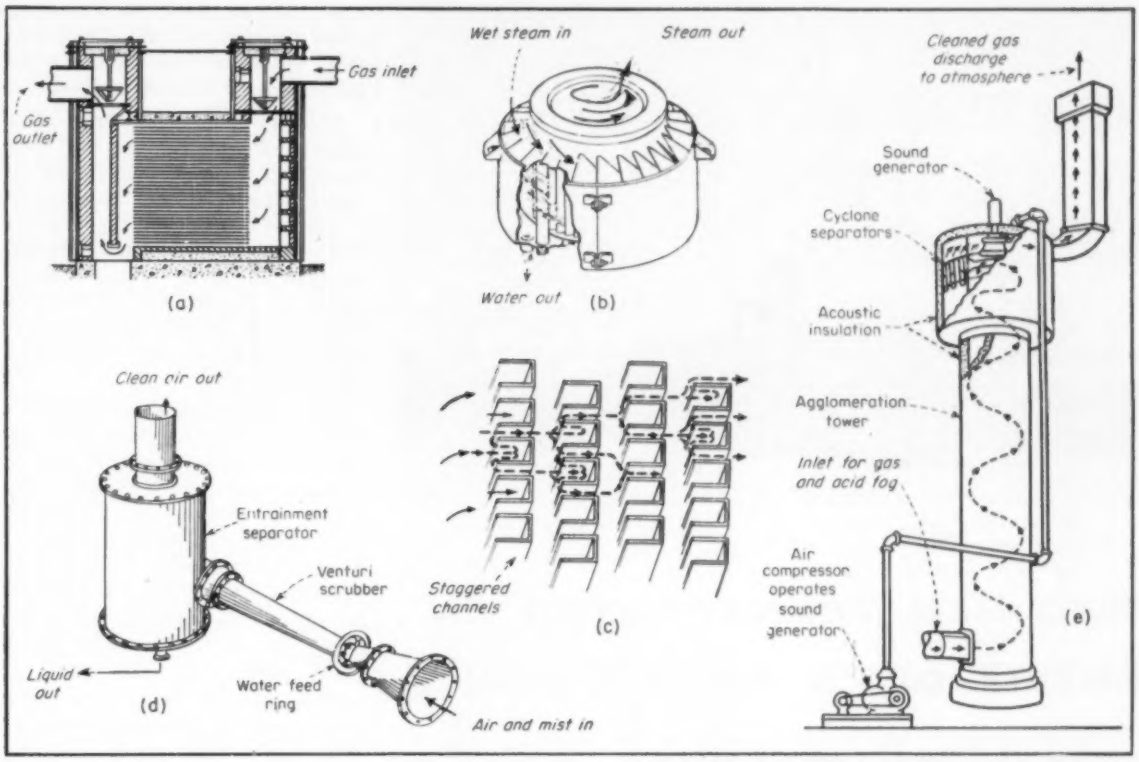
For a better evaluation of ENTERPRISE Diesels and service, therefore, we have set down a few of the more important considerations that you should know about these engines:

- **Every ENTERPRISE Engine** is Custom-Built—*precision*-built—to your exact power and installation requirements. Your engine is designed, built, equipped, tested and installed to do its specific job with greatest possible efficiency.
- **Conservative Ratings** assure ample power reserve for emergency or sustained overloads. There is no sacrifice in efficiency, with long, trouble-free engine life.
- **ENTERPRISE Diesel Experience** in marine and stationary power reaches through 33 years and hundreds of outstanding installations. During this period ENTERPRISE has made many valuable contributions to improved diesel design and engineering development.
- **Efficient and Dependable** for municipal and remote industrial power. Profit from this *independent* source of power—eliminate the need for high-rate purchased power.
- **A Record of Profitable Operation** in both stationary and marine power everywhere! We will be glad to refer you to ENTERPRISE customers whose experience and documented savings will clearly describe the satisfaction you too will enjoy with this equipment.
- **ENTERPRISE Service Engineers** are highly competent and thoroughly qualified to supply every phase of service required in your diesel installation and operation.
- **Immediate Availability of Parts** from factory stocks located at major ports. Shipment of repair or replacement parts on short notice by air, land or sea is handled promptly and efficiently to meet the needs of the customer.

When you inquire, you will find that power problems very similar to yours have been successfully solved with the installation of ENTERPRISE dependable Diesels. You can rely on this highly specialized experience for the best answer to your needs. Write us today for full information, stating your specific power requirements.



Typical ENTERPRISE powered craft



Entrainment Removal Methods

. . . are a subject of prime interest to engineers and production men engaged in many different types of processing because they greatly affect product quality and yield and reduce equipment maintenance

WHENEVER A GAS or vapor is generated from a liquid or when a gas passes through a liquid, complete separation of the two phases never occurs. The gas entrains and carries with it varying quantities and sizes of liquid droplets.

Entrainment removal is a problem in many chemical processes and is carried out in such equipment as distillation columns, packed towers, absorption columns, flash tanks, vacuum towers, evaporators, stills, deodorizers, separators, accumulators, knockout pots, and steam-boiler drums.

Purposes of entrainment separation are to:

1. Remove liquid particles from the gas when they would be harmful in a subsequent process.

2. Return recovered liquid for further processing when the product is a vapor, thus increasing quality or yield.

3. Collect and recover a valuable product.

4. Reduce air pollution and working hazards.

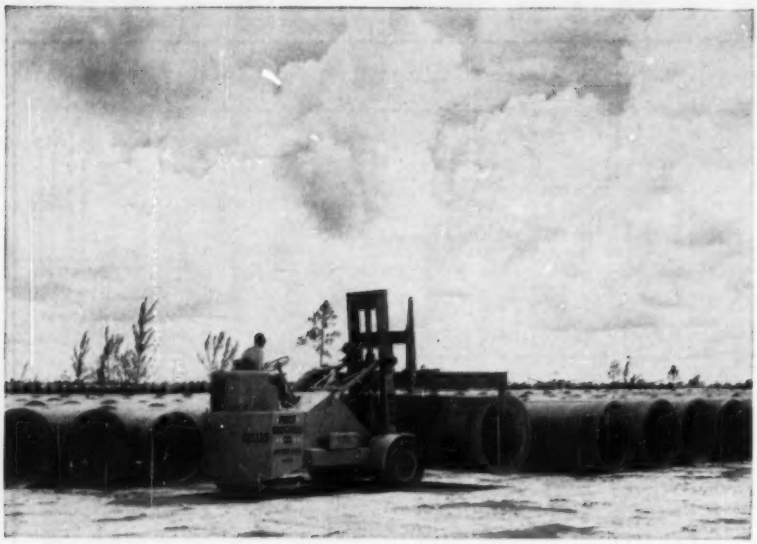
5. Reduce equipment maintenance by eliminating, for example, the danger from slugs of liquid entering compressors or turbines.

An ideal separator should be compact, low in initial and operating costs, high in removal efficiency at low velocities, and automatic in operation. It should effect a sharp separation with minimum pressure drop and provide means of either recovery of valuable materials removed from the collector or simple disposal of undesirable liquids.

Several different types of equipment are in use. Surveyed here are types and performances of typical separators.

• **Gravity Settlers**—Their function is to reduce the velocity of gas so that gravity can remove the entrained liquid. Actually, any knockout pot, accumulator, or expanded section in a line that provides a horizontal surface is a gravity settler. Its practical use is limited to 50 to 100 microns as the minimum removal size.

A settler can be simply a large



TWO MEN TRANSPORTED AN ENTIRE DAY'S PRODUCTION... *and had time for other work!*

Are you interested in cutting your cost of handling extremely heavy, bulky items? This experience of Price Brothers Company, Dayton, Ohio, as described by Paul L. Osweiler, chief engineer, tells how two men operating Ross Heavy Duty Fork Lift Trucks move an entire day's output of 12,000-lb. pre-stressed concrete pipe, of 48-inch diameter and 16 feet long—and had time left for doing several other necessary handling operations.

By any other handling method, Mr. Osweiler said, this difficult task would require much more time and several more men. Officers of the company are convinced that the use of Ross machines is the fastest and most economical method of handling their products; and that conviction is shared by experienced users throughout the world.

It is probable that your business would benefit substantially from use of Ross machines. It costs nothing to investigate, and may easily lead to large economies. Consult the Ross representative near you or write to us.

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chamber or of the horizontal-baffle type, such as the Howard settling chamber shown in (a). The particles settle on the baffles after traveling only a short distance.

• **Centrifugal Separators**—Simplicity of construction and low maintenance cost make centrifugal separators the most commonly used equipment for entrainment removal. Efficiencies are not as high as those of some other types of separators. A droplet size of 5 to 10 microns is generally considered the lower-size removal limit.

This type of separator removes entrained particles from the gas carrier by radial acceleration. It usually consists of a cylinder into which the aerosol is introduced tangentially and at high velocity. The circular motion imparted to the fluid causes the particles to separate from the carrier and impinge on the side walls, from which they settle downward.

Typical centrifugal separators are the Hi-eF Purifier shown at (b) (V. D. Anderson Co.), Multiclone (Western Precipitation Corp.), Van Tongeren cyclone (Buell Engrg. Co.), Sirocco collector (American Blower Corp.), and Flick separator (Wurster & Sanger, Inc.).

• **Impingement Separators**—This type works by directing particles against a surface, accompanied by a centrifugal force as the carrier moves toward the outlet. When the carrier strikes the obstruction, the entrained particles continue until they impinge on the surface. The gas turns to go around the obstruction, leaving the particles behind.

Typical impingement separators include the Tracyfier shown at (c) (Blaw Knox Co.), PL separator (Ingersoll-Rand Co.), Strong separator (Strong, Carlisle & Hammond), and type E separator (Wright-Austin Co.).

• **Scrubbers**—Use of scrubbers of the more complex type is fairly recent. Their action is to provide a surface for particle removal. All scrubbers include a method of getting a fine particle size of scrubbing liquid, mixing this stream with the gas to be scrubbed, keeping contact for a specified time, separating the gas from the liquid,

and providing a way to remove the liquid or recycle it.

Forces that act to remove entrained particles are impingement, diffusion, electrostatic, gravity, and centrifugal. Impingement is of major importance; scrubbing-liquid particle size should be from 50 to 100 microns for best results. Diffusion becomes significant for smaller particles sizes—up to 5 microns.

Eight common types of scrubbers are: (1) chambers, washers, and sprays; (2) centrifugal scrubbers; (3) venturi scrubbers, as the Pease-Anthony unit (d) (Chemical Construction Corp.); (4) impingement scrubbers; (5) wet filters; (6) packed scrubbers; (7) film-type scrubbers; and (8) scrubbers with rotating elements.

• **Electrostatic Precipitators**—They have found broad use in entrainment removal as they can remove extremely small particles at high efficiencies. They operate by ionizing the gas (and particles) by an electrical discharge. Charged particles then migrate to electrodes of opposite potential, are precipitated and collected.

Two basic types are (1) the single-stage precipitator in which ionization and collection are combined and (2) the two-stage precipitator in which ionization and collection are done in different zones. The single-stage unit is commonly used for entrained liquids.

• **Ultransonic Precipitators** — Sound vibrations above a certain frequency can coalesce particles. Thunder claps and explosions, for example, can cause rain. And air-raid sirens can precipitate fogs.

Application of ultrasonic forces for aerosol collection is a new idea. It has been tried successfully for collection of sulfuric-acid mist (mist eliminator (e) made by Ultrasonic Corp.).

Ultrasonic vibration causes entrained particles to vibrate, collide, and coalesce. The larger particles formed are then collected by one of the more usual techniques—centrifuging, impingement scrubbing. Collection efficiency depends on sound intensity and exposure time. With exposures up to 4 sec., the efficiency ranges up to 99%.—Chem Eng, Oct, p213

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The Simmons Machine Tool Corporation of Albany, N. Y., which has provided heavy machinery to the United States, South American, European, and Asiatic markets for over 40 years, has become the exclusive export sales agency for the Ace-Central States Machine Tool Company of Detroit, Michigan.

The Ace-Central States Machine Tool Company *designs, builds,* and *installs* complete manufacturing units, including automatic and automation equipment, large jigs, fixtures and supporting tools. Thus it offers a complete design-to-finished-product service, which is used widely by automotive manufacturers and other mass-production companies in the metal-working and electrical industries.

The Simmons Machine Tool Corporation, Export Division, 50 East 42nd Street, New York City, will handle the Ace-Central States export sales and engineering service. Simmons itself is known throughout the industrial world as a pioneer rebuilder and modernizer of heavy industrial machines. It also builds large new machine tools. By representing Ace-Central States, it provides a complete machine service to heavy industry in foreign markets.

Ace-Central States combines the engineering and mechanical staffs and facilities of two well-known Detroit concerns. They are the Central States Engineering Corporation, one of the largest Detroit design engineering organizations in mass production equipment, and Ace Tool and Die Company, a prominent builder of special machines, supporting tooling, jigs, gauges, and fixtures.

Important: Write for this informative book "*Design-and-Build*," today.

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ASSORTED vitreous-enameled aluminum bowls and plates are given initial firing of 6 min. at 1000° F. in the . . .

Vitreous Enameling of Sheet-Aluminum Ware

Bowls, vases, plaques, ash trays, and wall decorations have been made by Edward Winter, a Cleveland artist, from vitreous-enameled sheet aluminum. His research into this decorative and fine-art field was sponsored by the Aluminum Co. of America.

Enamels are the low-temperature enamels developed by Du Pont. They show a wide range of color, texture, and design. Using metallic oxides with intermixtures allows production of any conceivable color or subtle tone effects.

Winter produces the objects by two methods: (1) a sgraffito technique of making free-hand white-line drawings with a dental tool through the mat surface of black enamel or (2) painted designs using liquid fire gold. Colors include lime chartreuse, carnation pink, dove gray, cerulean blue, forest green, and black and white.

Enameled aluminum will not compete with copper or steel, but rather complement them and other finishes. Its characteristics—lightweight, corrosion resistance, and impact strength—make it ideal for home use and architectural decoration.

Many uses have been suggested. Architectural panels for curtain-wall construction and large decorative murals have already been made. Other possibilities include: marine construction, cocktail lounges, dining rooms, stoves, refrigerators, furniture, store fronts, trains, and elevator doors and cabs.

Before enameling, the metal must go through a special pickling operation. The enamels are then applied, dried, and given three or four separate firings.—Ceramic Ind, Oct, p49

Break-In New Tractors

A new tractor deserves a good start in life. You can help launch it on a better and longer life by properly breaking it in. If you have them, follow the distributor's break-in recommendations.

Put in break-in lubrication if you plan to work the tractor immediately. Make sure the engine is completely warmed up. The engine should run at a fairly fast idle.

Once the engine is completely warmed, it is excellent practice to give the tractor an exercise run. This is a good safety measure.

Your tractor is now ready to run. But operate it in a gear that will not pull the engine below rated speed. The period of moderate operation is usually about 30 hr. Traveling speeds should be kept moderate to give track rollers and chassis assemblies a chance to seat themselves and take on wear hardening.—Const Meth & Equip, Sept, p87

"Roof Sewing"—It Works Where Roof Bolts Fail

An unusual ground-support method is practiced in the A/S Sulitjelma Gruber mine in Norway. It is used where conventional roof-bolting techniques will not work.

Holes are drilled into the top and a ½-in. wire-rope loop is pushed to the top of the hole. The rope extends to the next hole 2 or 3 in. away and the wire-rope loop is pushed to the top again. This is repeated indefinitely.

A ¼-in. pipe is also pushed to the top of the hole. Next a short piece of ¾-in. pipe with a cement-gun connection is placed in the hole. Then a solid plug of SILEX is placed, sealing the hole. SILEX hardens in a few minutes and will stand the cement gun pressure. Ingenier Harold Henschien & Co., Oslo, Norway, makes SILEX.

Cement grout is pumped into the drill hole through the ¾-in. pipe and all cracks and fissures. Air is ejected through the ¼-in. pipe. When grout can no longer be forced into the hole, the job is complete.

Success of this method is attributed to the fact that loose rock is cemented into one solid block that is suspended by the wire-rope loops in the drill holes from solid rock overlying the loose-rock. The system has been used for about 7 years with no failures.—Eng & Min J, Sept, p91

Vinyl-Plastic Laminate

Decorative and permanently rust and corrosion-proof laminate is made by U. S. Rubber Co. by bonding vinyl plastic to steel or aluminum. Marvinol-Metal Laminate is suggested for a number of uses: building siding, interior paneling, lawn and office furniture, business-machine housings, chemical containers, piping, counter tops.

Laminate cost is higher than that of galvanized iron but only one-third that of comparable-gage stainless steel. Up to the present, vinyl films of 0.002 to 0.02 in. in thickness have been bonded to cold-rolled steel, hot-rolled steel, and aluminum from 18 to 34 gage.—Chem Wk, Sept 19, p66

New Coating Technique Covers Wire with Teflon

A new method for applying Teflon tetrafluoroethylene resin insulation to bare wire, known as three-dimentional calendaring, has been announced by E. I. du Pont de Nemours, Inc.

The process involves feeding a number of bare wires, together with Teflon powder, into the nip of two calendar rolls that have been grooved to permit passage of the wires, and to provide the pressure required for the cold-forming of the coatings around the wires.

The wires are fed through straighteners and a series of paralleling guides before entering the bite of the calendar rolls. Teflon powder is fed by means of a vibratory hopper to the nip of the rolls, where it is cold-pressed onto the wires as they pass through.

The entire coated assembly is passed into a sintering oven or bath where the coatings are fused at about 750°F. The entire assembly is then taken through rotary trimming knives, where the coated wires are separated and reeled.—Electronics, Sept, p304

High Sulfur Recovery

New sulfur recovery plant at a Stanolind Oil & Gas Co. refinery recovers 92% of the sulfur available in an acid gas feed with only 15% hydrogen sulfide. It was designed and built by Fluor Corp., Ltd., of Los Angeles.

One-third of the acid gas is mixed with air and heated in a reactor furnace with checker brickwork. Combustion gases plus the other two-thirds of the acid gas flow to a primary converter containing bauxite catalyst. The hydrogen sulfide and sulfur dioxide here react to form sulfur and water.

Gases then flow through a feedwater economizer for cooling, and part of the sulfur is removed as a liquid. Gases then continue on to a second catalyst bed to complete the conversion and into a sulfur wash tower to condense sulfur vapors by a countercurrent flow of cool liquid sulfur. Condensed sulfur is cooled and piped to the sulfur pit.—Pet Proc, Sept, p1345

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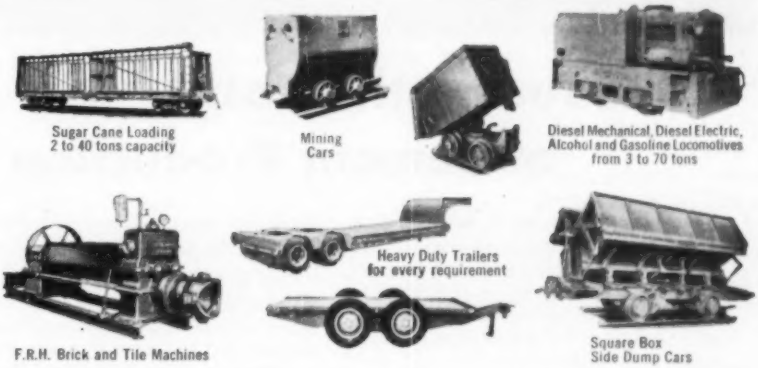

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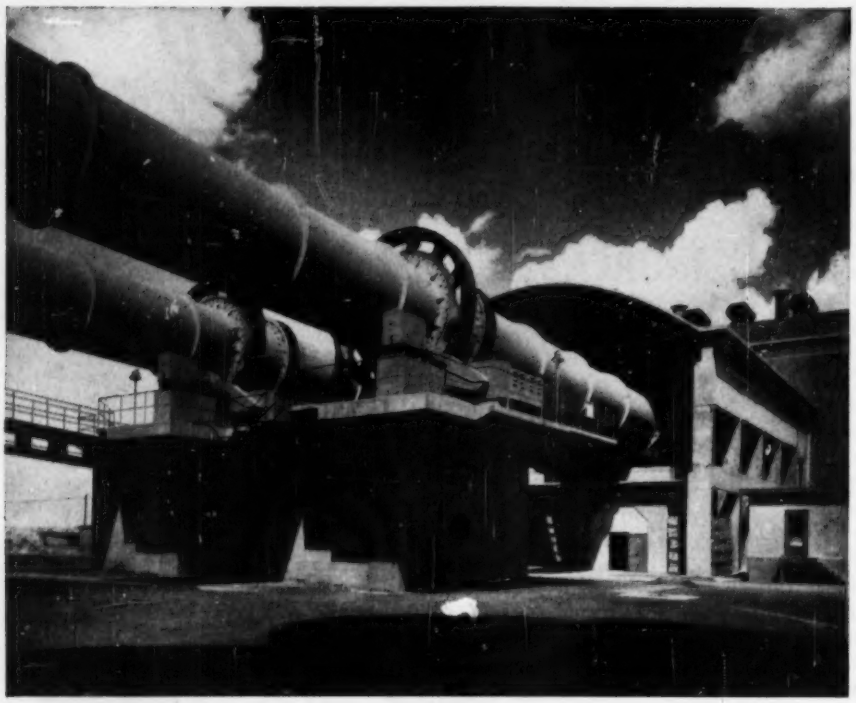

Reducing the Cost of Cement Production

THROUGHOUT the world Allis-Chalmers equipment is being used by cement producers to increase production and reduce costs. Allis-Chalmers can supply either a complete modern cement plant or component machinery for modernizing existing plants.

Allis-Chalmers air-cooled kiln ends, for example, will pay for themselves in refractory savings alone. Brick need not be changed as frequently as in other types. As a result, you have fewer shutdowns.

Movable firing hoods supplied by Allis-Chalmers can easily be adjusted to compensate for expansion and contraction of kilns. They maintain a good air seal with kilns, keeping cool air out and reducing hot air loss at kiln end. Heavy construction means hoods will stay round and rigid after years of service. Standard refractory brick is used.

And Allis-Chalmers air-quenching coolers give maximum kiln economy and fuel utilization. Hottest air from the cooling clinker is recaptured and returned as secondary air to the kiln, saving fuel costs. True air-quenching of clinkers results in a product that is easier to grind.

To obtain complete information on Allis-Chalmers products for the cement industry, contact the Allis-Chalmers representative in your country, or write:

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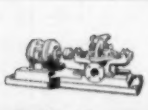
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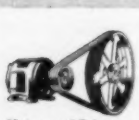

Motors and Drives

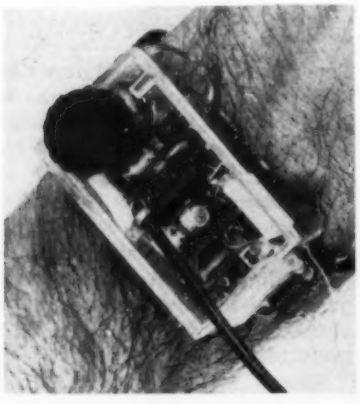
ALLIS-CHALMERS

TECHNICAL SHORTS

Germicide Easy on Metals—Aluminum sheet, soaked overnight in strong solution of Antilac, new fast-acting germicide made by Wyandotte Chemicals Corp., Wyandott, Michigan, showed no signs of corrosion. Fifteen-second exposure is recommended as effective for sanitizing.—Food Eng, Sept, p175

Auto Air-Conditioning — Automobile makers in the low-priced field will come out with air conditioning for some of their cars in 1955. Development of economical air-conditioner and heater in one unit is underway.—Auto Ind, Oct 15, p20

Britain to Import-Export Coal—Large-size coal will be imported into Great Britain this winter from Western Europe to enable British to meet their coal-export commitments. Export orders for small and fine sizes are increasing, but British householders continue to prefer lump coal that is growing scarcer as mechanized mining develops.—Coal Age, Sept, p186



Tansistorized Radio

This neat little wrist radio, developed by the U. S. Army Signal Corp., can receive stations 40 mi. away. Secret of its power is its circuit of five transistors. It weighs 2¼ oz.; its plastic housing is 2 in. long, 1⅛ in. wide, and ¼ in. thick. Power comes from a mercury battery about the size of a pencil tip.—Electronics, Oct, p5

Channel-Wing Brigadier Flies

Baumann Brigadier equipped with Custer channel wings takes to the air during its recently inaugurated test program. Designated the CWW-5, the light transport craft seats four.—Aviation Wk, Sept 28, p18

Thermit-weld Patterns — Kaiser Steel Corp. has developed a wood-pattern method for repairing broken rolling-mill rolls by thermit welding. This method replaces conventional wax-molding procedure, reduces molding time by one-third, saves 2 hr. for melting out wax, and saves the cost of 30 to 35 lb. of costly molding wax.—Weld Eng, Sept, p44

Turns Six Blades—Hydraulic high-speed copying lathe made by the French firm of H. Ernault-Batignolles turns the convex surfaces of six turbine blades at one setting. It has two work stations and two copying slides. A three-dimensional master form controls work speed through an electronic system to keep it at maximum value.—Mach, Aug 15, p1356

No More Decay—That will be the battle cry in the new advertising spree shaping up in the toothpaste field. More "miracle" chemicals, anti-enzymes, are claimed to halt tooth decay by preventing the conversion of sugars and starches in the mouth to tooth-destroying acid. Chemicals are sodium N-lauroyl sarcosinate and sodium dehydroacetate.—Chem Wk, Aug 29, p50

New Depth Record—By the last week in August, Ohio Oil Co. on a wildcat well in California reached a depth of 20,600 ft. That betters the previous world record of 20,521 set by Superior Oil Co. in Wyoming. Ohio Oil's well is expected to go to at least 21,000 ft. October marks the second anniversary of the job.—Oil & Gas J, Aug 31, p40

Greater Clearance, Less Wear—Several plants have increased the end clearance angle on single-point carbide tools on the theory that work compresses under a tool's cutting edge, then springs back and rubs against flank just under the edge. Increasing the angle to 12 to 18° from 7° can multiply life by three to four times.—Am Mach, Aug 17, p145

Trainees Produce—At Boeing Airplane Co.'s Seattle plant, trainees produce while learning. Fifty-three different kinds of metal products with a total value of more than $23,000 were fabricated by trainees last year for use in Boeing offices and shops. Products are selected to give trainees practical work along lines most useful to them at their jobs in the plant.—Factory, Sept, p110

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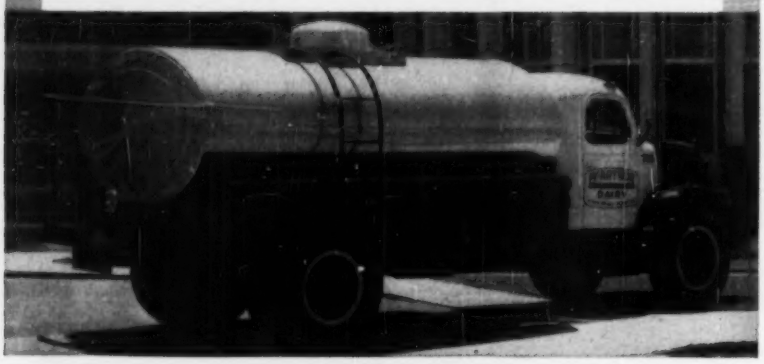

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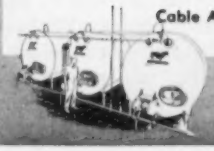

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Metallic-Yarn Making: A Technical Process

Problems in the manufacture of flat, narrow, ribbon-like metallic yarns—now popular as decoration yarns in knitted and woven fabrics—are chiefly in chemical formulation, in color control and proper registration in laminating, and in slitting.

Steps in the yarn processing at Metlon Corp. are:

1. Coloring and coating the basic aluminum foil.
2. Laminating resinous film onto one side of the foil.
3. Rerunning the foil through steps 1 and 2 so that the other side can be color-coated and laminated.
4. Splicing rolls of film.
5. Slitting the film into band widths.
6. Final narrow-width cutting and winding.
7. Inspection and packing.

Except with acetate dyes, metallic yarns are fast in color and fast to cross dyeing by standard procedures. It is advisable to run small samples first when using metallic yarns for the first time. Fabrics with these metallic yarns are successfully piece-dyed without the metallic-yarn coloring being affected, except in cases involving the disperse type of dyes. —Textile World, Sept, p134

Listens For Insects

There may soon be rapid detection of insect infestation of grains in storage through the use of an electronic device that listens for larvae hidden in the kernels.

Consisting of a low noise-level audio amplifier and a microphone loud speaker, the system receives the sound of insect larvae and pupae as they move and feed inside grain kernels placed in a soundproof box.

Special applications would be possible in large storage bins where constant checks could be made by a permanent set-up like present thermocouples that give continuing checks on temperature.

The listener was devised by Drs. R. Adams, J. Wolfe, M. Milner and J. Shellenberger of Kansas State College.—Food Eng, Oct, 258

Poor Materials Control in Any Job Shop Shows up with These Symptoms:

1. You often cannot complete units because any one of many parts is missing. That costs you plenty—in idle facilities, higher supervisory costs, and rehandling of partially assembled units.

2. You try to insure adequate parts supplies by accumulating big inventories. On extended jobs, some parts can remain in your plant for more than a year before use. That means you have to maintain an inventory out of all proportion to your shipments of finished products.

3. You have lots of trouble with unbalanced inventories—too many of one part, not enough of another. No one can make accurate allowances for shrinkage. Furthermore, some components may be of such a nature that the vendor must be allowed to make a reasonable production over-run.

Unbalance can upset production schedules. You do not know what parts will be in short supply. They may require a long lead time, or you may have to pay for heavy set-up charges.

Job-Shop Materials Control

This simple, low-cost program for job-shop operations covers everything from checking purchase orders to salvaging defectives. For Specialty Assembling & Packing Co. it has really paid off

A SAVING IN MATERIALS of 2% at Specialty Assembling & Packing Co.'s job shop is equivalent to a 10–16% cut in direct labor costs. The reason is many of its electronic components and assemblies cost five to eight times as much as direct labor. Besides such savings, Specialty got these added benefits:

- Supervisors became more conservation-conscious.
- Unexpected parts shortages were eliminated.
- There was no "hoarding" of materials to worry about.

To minimize job-shop control problems, Specialty set up the following specifications for its materials control plan:

- **Low operating cost**—It wanted a program that yielded the biggest spread possible between the savings obtained and the cost of control. One clerical worker is adequate to handle all record-keeping.
- **Flexibility**—Specialty wanted a plan that would permit emergency measures to meet emergency situations. Its system tracks inventory and rate of shrinkage continuously, and causes proper action to be taken in time to meet production schedules.
- **Simplicity**—Complicated programs are expensive to install, require a major educational effort, and continually tempt evasion.

Specialty's program is easy to operate and understand. It has a separate materials control department under a full-time supervisor. He reports directly to the plant manager.

Five key forms keep the paper work simple:

1. Stock record card—It is a well-known perpetual inventory record form. Specialty uses a 5 x 8-in. card, kept in Kardex files. The card originates upon receipt of a bill of materials from engineering for production jobs, or from purchase orders issued on spare-parts jobs. There is a card filed for each item in the stockroom.

2. Receiving and inspection report—Receipt of materials into the plant starts an RIR for each item received. Copies go to accounting, incoming inspection, purchasing, stockroom, materials control, and receiving.

3. Move ticket—Foremen use this form to return spoiled, unusable, or excess materials to the stockroom. Foreman sends two copies with the material. One stays in stockroom, other goes to materials control.

4. Rework order—Plant manager originates this order to repair material. After work is completed, the two copies go to inspection, stockroom, and materials control before both return to the plant manager.

5. Summary requisition list—It lists all parts required to make a product, including number of each part per product unit. Requisition need note only quantity and identity of product.

In addition, other forms normally used in any plant are utilized by the materials-control department: purchase order, for record of materials on order; bill of materials, issued by engineering for each product; requisitions for materials, to post stock record cards; production schedules, to review stock balances; work orders (production authorizations), to review materials availability.

Materials control should also keep a log of confirmation of purchase orders and expediting efforts. Specialty has standard index cards, filed by purchase order number for this job.—Factory, Oct, p99

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Mold-Making Machine Automates the Foundry

More and more foundries are moving toward automation. Latest step in this progress is Osborn Mfg. Co.'s mold-making machine. Handled by two operators, the machine will turn out about 240 molds for engine cylinder blocks per hour. By manual methods, it takes four workers an hour to make only 50 of these molds.

The switch from manual to mechanical is based on five main operations. Because a mold is made in two halves that are later joined together, the machine does its forming work in two sections. The sections go through the first four steps simultaneously:

- Each section cleans its half of the pattern.
- The flask drops into place around the pattern half and fills with sand.
- The sand is jolted and squeezed around the pattern half until it is hard enough to support molten metal.
- The finished mold half is stripped from the pattern, ejected from the machine section, and loaded onto a conveyor line.

For the last step, a third section of the machine takes the two mold halves and fits them together. The mold then leaves the machine and goes to the pouring section of the foundry.—Business Wk, Sept 5, p64

Trough Cuts Good Sample

Representative samples of five coals at Hampton Mines, Westmoreland Coal Co., W. Va., are secured at the railroad car by a trough swung by an operator at high speed through the stream coming from the loading boom. The trough rests in a rack on a horizontal jib pivoted on a column between loading tracks. To empty the trough into the container, the operator slides the trough in toward the column and then raises the outer end until the coal slides out.

In a few minutes time the whole device can be shifted to serve the adjacent track. Results compared to other methods of hand sampling have been excellent.—Coal Age, Sept, p116

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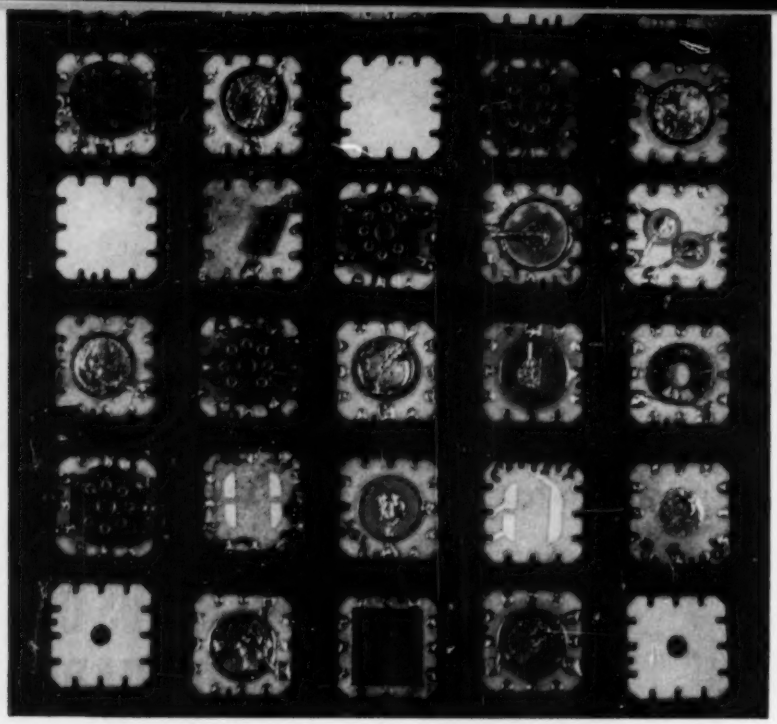
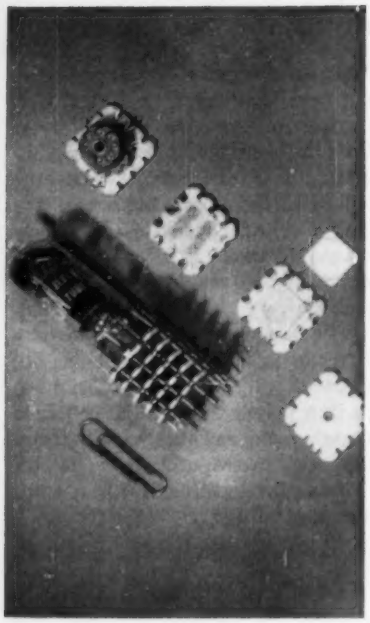
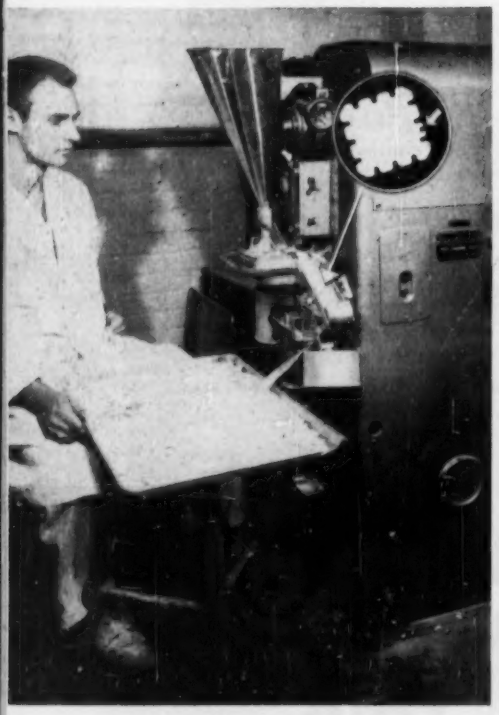


CERAMIC WAFERS are the starting point. They are made and inspected automatically. Notches are metallized to pass electric current. Tiny sockets, resistors, coils, crystals are fastened to the face. They will later be stacked.



THIS is what the wafers look like after they have been assembled into a module under an electron tube.

Factory That Runs By Itself



PRESS especially developed for Operation Tinkertoy turns out 2,800 wafers an hour from raw materials.

WAFERS are spread out on trays and carried to an oven for 9 hr. of curing. Edges are then metallized.

RECENTLY the U. S. Navy Bureau of Aeronautics and National Bureau of Standards revealed what they have been doing mysteriously for the past 3 years under the project named Operation Tinkertoy. They have been making the first fully automatic plant in the U. S.

Completely untouched by human hands—except for a few expert overseers—the plant can turn out 1,000 modular components for electronic devices an hour. To do this, it uses a wide variety of such strange things as face powder, adhesive tape, and machines designed by a doughnut maker.

Basic ingredient of the process is a thin $\frac{3}{4}$-in. square ceramic wafer notched around the edges and impressed with flat electronic components—resistors, condensers, and sockets. These are stacked one on top of the other like cookies and connected by wire risers soldered in the notches.

The wires make the assembled wafers a rigid structure called a module. They also supply an electric path between components.

Snipping the risers any place between wafers makes it possible to vary the circuits. These electronic modules are finally mounted under an electron tube and plugged into a piece of equipment, doing away with the usual puzzle of wire found underneath conventional electronic devices.

The wafers are made in a device that presses them directly from raw materials (talc, Kaolin, and barium carbonate) at a rate of about 2,800 per hr. It presses and notches them and sends them on to a kiln for a 9-hr. curing.

Tape resistors, coils, potentiometers, crystals, and metallizing of the notches are all completed in the same way and inspected by automatic devices. Then the two —wafer and component—are joined together automatically.

The pilot plant is run for the Navy by Kaiser Electronics Division of Willys Motors Corp. Finding and proving just what this plant and others like it can do for industry in general has been assigned to a New Hampshire research firm headed by Royden C. Sanders, Jr. So far, Sanders has ventured to say that the idea might be put to use in the manufacture of radios and television sets. He has already engineered a submarine detection device, a radio altimeter, and a radio control receiver.

The outlook for immediate use by the whole electronics industry is dim. It would mean conversion on a large scale, with a tremendous outlay that could not soon be recouped. Right now, most radio and television-receiver makers are satisfied with their soldering-iron brigades and hand assembly. Eventually, automation and its attendant equipment will be cheap enough. But it may be years off.

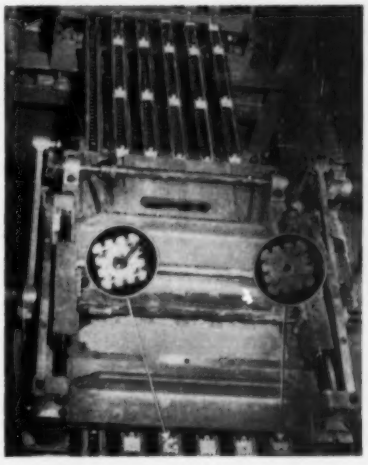
Two things stand out as bold recommendations for Tinkertoy:

- A plant like this can cut down lead time by 75%.
- Repairs of modulized equipment is a simple operation.

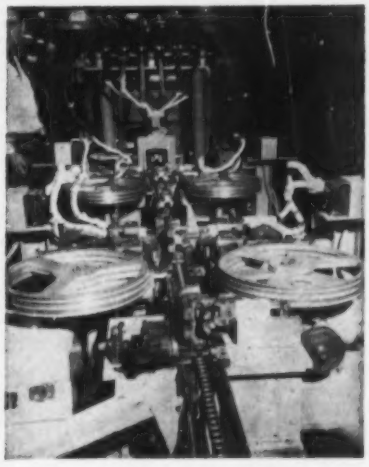
These are big attractions to military people and of growing importance to the televisions and radio manufacturers who could make their sets more attractive to buyers who want cheaper repairs.

Aviation Wk, Oct 12, p72

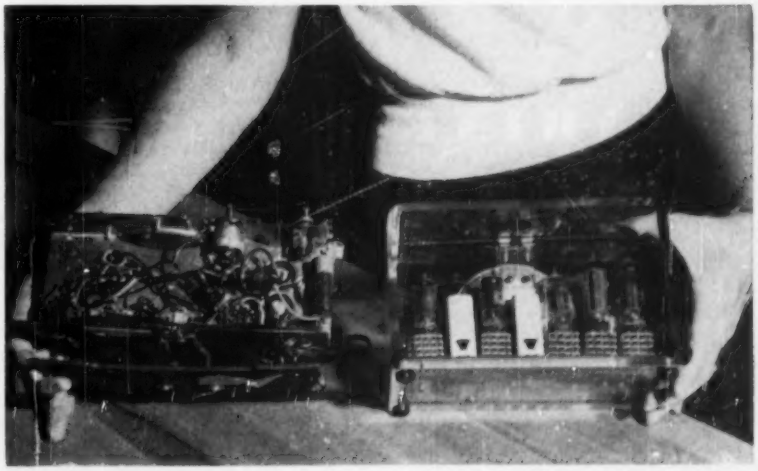
PARTS of circuit are glued or printed on the wafers, then inspected by machine. Sorting machines (upper left) vibrate wafers into correct order, line then up, and send them on, one at a time, to the assembly machine.



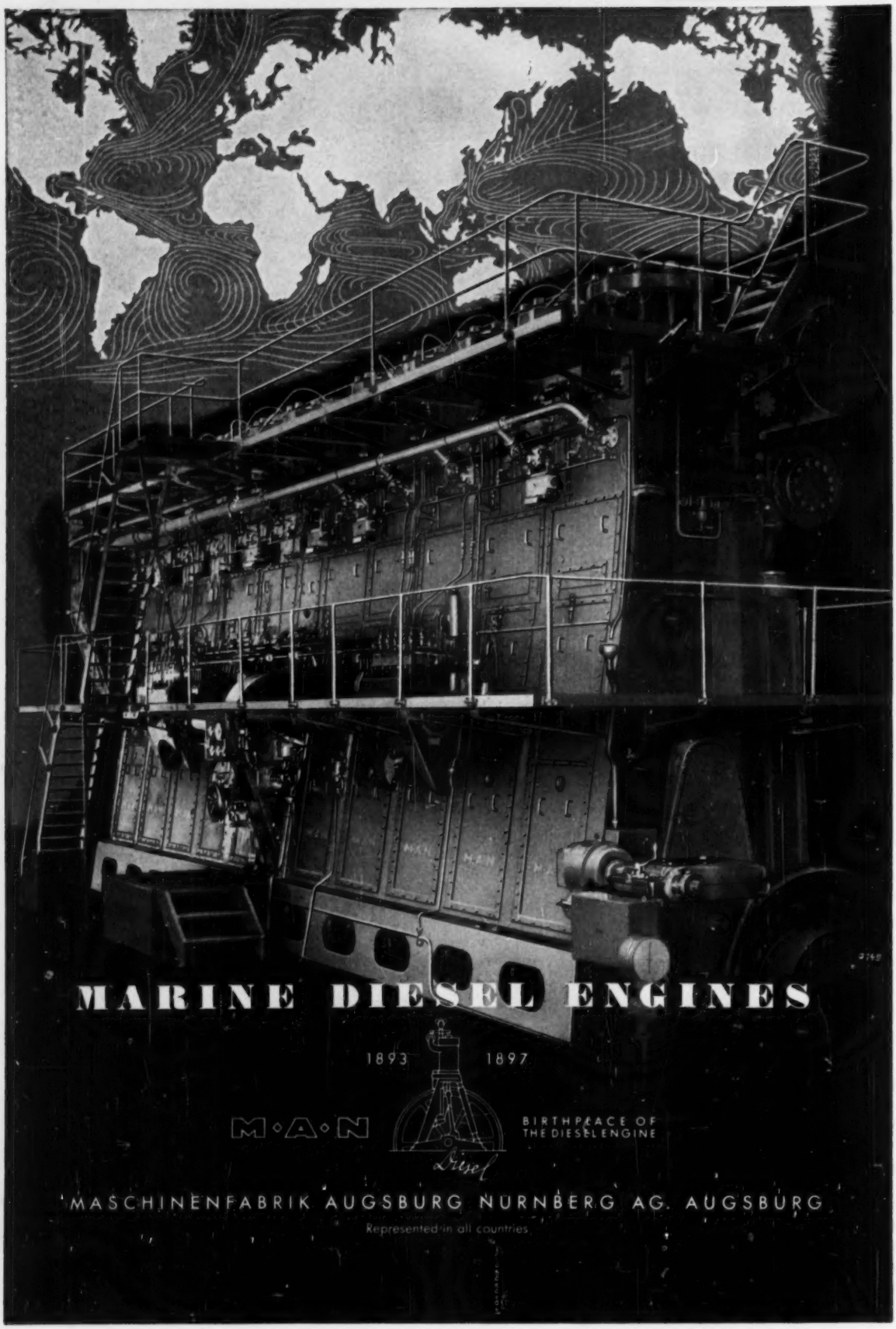
PRINTER silver-paints six wafers simultaneously with required pattern of conductors that connect to notches.



AFTER STACKING, the wafers are hooked up by wires on these reels. Wires are all soldered simultaneously.



MODULE UNITS are sorted and then tested on automatic machine guided by punchcard directions. Modules are mounted under tubes and plugged into set. Maze of wire is replaced by neat, easily-serviced units.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Portable Device Measures Road-Pavement Deflection

An inexpensive portable device measures deflections of highway pavements under moving load. It was designed by A. C. Benkelman of U. S. Bureau of Public Roads in connection with the Western Association of State Highway Officials' Test Road, Idaho.

The device measures deflection caused by one double wheel of a loaded truck or trailer as the vehicle moves forward at creep speed. By using two such devices, the deflections that are produced in both wheel paths can be measured simultaneously. Engineers believe that the device would be effective in evaluating existing pavements.

It is simply a long lever arm with three-point support of a pivoted fulcrum. The lever arm extends under the wheel and rests on the pavement. The truck is rolled forward and the maximum deflection as the wheel passes the end of the probe arm is noted on an Ames dial at the other end of the lever arm.—Eng News Rec, Oct 1, p29

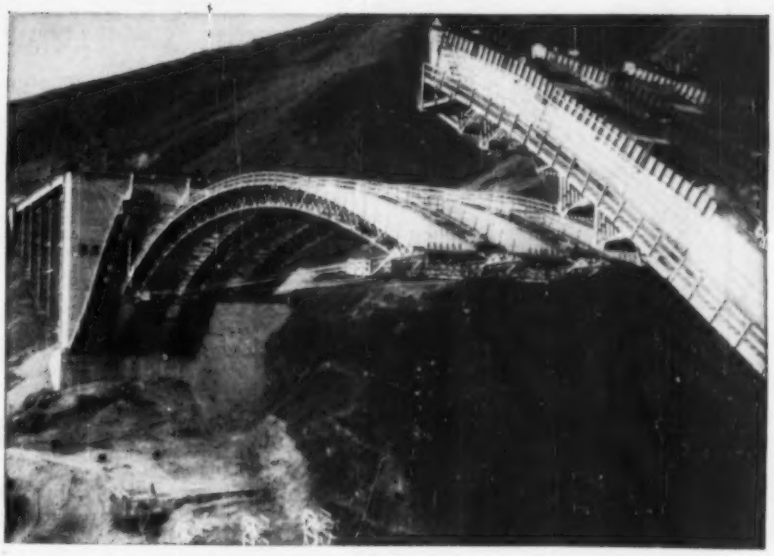
High-Rake Milling

Progressive development of high-rake tools at General Electric Co. has improved machining of corrosion-resistant and stainless steels. A high-rake milling cutter is given a rake angle of 34°, compared with conventional angles of 4 to 10°.

A conventional staggered-tooth, side-milling cutter of 4½-in. dia. by 9/16-in. face cut only 3 in. of Series 300 stainless steel before dulling. Speed was 73 ft. per min., feed 1⅛ in. per min., and cut ½ in. deep. Increasing the rake angle to 34° permitted increasing feed to 8 in. per min., speed to 123 ft. per min., and cut to ¾ in.

The same cutter on 61S and 52S aluminum alloys showed no wear and did not heat up at a speed of 1,118 ft. per min., feed of 90 in. per min., and ¾-in. cut. On other jobs, alloy steels were machined successfully at 35 Rockwell C hardness with feed of 6 in. per min. and speeds to 89 ft. per min. —Am Mach, Sept 28, p133

Production Ideas...



from the Construction Industry

There's something new in the construction industry — *portable assembly lines!* You'll find them now in river canyons or on mountain slopes — wherever construction is underway.

With new, multi-purpose power tools, mass production methods are used on the job-site in building dams and bridges, highways and tunnels, public works, housing developments and other projects.

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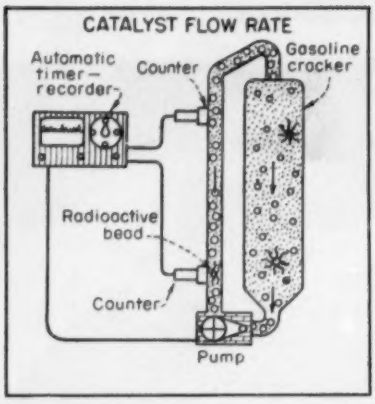
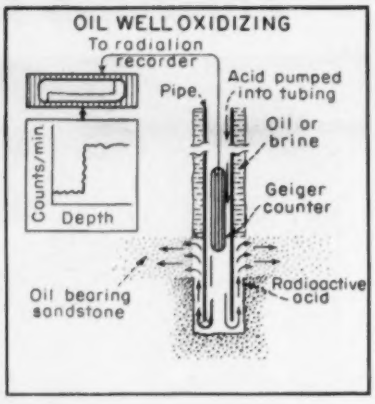




New Tool for Oil Industry

In production, refining, and transportation, the oil industry is finding an ever-increasing number of valuable, time-saving applications for radioisotopes

IN ONLY 7 YEARS, radioisotopes have achieved recognition as an important new tool in the petroleum industry. They are being applied primarily to show what is happening underground or in enclosed vessels where direct observation is not possible.

Their value is well demonstrated by their success in solving a difficult catalytic-cracking problem—measuring the rate of catalyst circulation. Impregnating a few of the catalyst beads and noting the time interval required for a radioactive bead to pass between two Geiger counters on the seal leg make it possible to calculate the circulation rate.

This application saved Standard Oil Co. of California a $100,000 shut-down and the expense of thousands of dollars a day for catalyst replacement. Catalyst beads were being consumed at four times the normal rate of 2 or 3 tons per day—at a cost of $300 per ton.

Radioactive beads were added, and the circulation rate was found to be too high, causing carbonization of the beads and reduced gasoline production. Reducing circulation rate decarbonized beads and cut replacement to normal.

Another use that is becoming routine is in the acid treatment of oil wells. Adding a radioisotope to the acid allows operators to determine acid-level depth without removing the pipe sections through which the acid has been pumped into the well.

Pipe-line operation also has been made easier by radioisotopes. Their use reduces the waste of interface products by one-third by acting as markers to separate different products flowing through the line.

Other applications include:

Locating leaks or obstructions in buried pipes.

Studying reactions in the Fischer-Tropsch process.

Measuring gear wear under various conditions of lubrication.

Studying dynamics of water-driving or gas-driving a water-oil or water-oil-gas saturated porous medium.

Detecting traces of antioxidants in various locations.

Determining fluid saturation of permeable cores.

Analyzing adsorptive and reactive properties of poly nuclear aromatics in complex petroleum mixtures.

Determining effects of fuel composition on wear rates of plungers in fuel injectors for diesel engines.

Measuring corrosion of liquids found in oil wells in inhibitor research.

Studying processes taking place in a lubricating oil on addition of an additive.

Measuring intake rates in water-injection wells in conjunction with water-flood projects.

Analyzing the chemical nature, mobility, and size of ions in liquid hydrocarbons.

Studying the mechanism of polymerization of synthetic rubber.

Measuring oil, gas and water permeability in three-phase flow in porous media.—Oil & Gas J, Sept 14, p108

Paced-Piece Maker Helps Trainees Reach Standard

No self-respecting piece-work trainee relishes the thought that he is not earning his way. On repetitive jobs not governed by machine speeds, the trainee always asks, "How fast am I expected to work?"

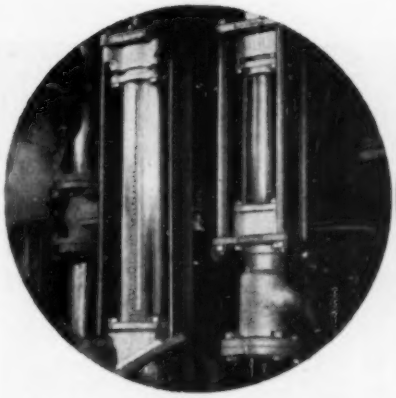
To help answer that question, Tung-Sol Electric Inc. set up a timing device called the paced-piece maker. It is designed to help operators increase their pace and earnings. When they use it, every piece they work on offers an individual challenge to their ability. And the degree of effort can be predetermined.

When a supervisor notices that one of his new operators has reached a low point of production and does not seem able to go beyond it, he introduces the paced-piece maker. He explains that the machine will be set to indicate the time it should take to finish a piece so as to produce a little more than he is presently doing.

When the time interval allowed per piece is up, a red light will go on. The object, the supervisor tells the operator, is to finish each piece before the light goes on, and to shorten the interval as his speed increases.

The supervisor watches the operator go through a few cycles to be sure everything is understood. At the end of an hour he checks results and encourages him. Tung-Sol finds an immediate increase in production through the use of the device. Increases have ranged from 15% to 40% in 3 hr. —Factory, Oct, p150

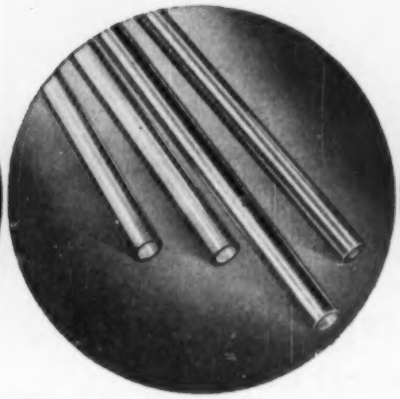
Glass tubing serves as a protective cartridge for fluorescent tunnel lighting.



Rate of flow of liquids checked with Rotometers.

Baster tubes help the housewife handle hot liquids.

CORNING brand pipe used as a structural material for new Johnson Wax Building.



Steam under high pressures requires tough corrosion resistance of CORNING brand gauge glasses.

Colored tubing for Neon signs possesses high dielectric strength.

Have You Ever Considered Glass Tubing?

As you can see, some imaginative engineers have used glass tubing by Corning to solve quite a range of problems. Supplied by Corning in a wide variety of characteristics and dimensions, it lends itself to countless applications. Available now and not too costly, it is worth a good look.

Here are some of the "built-in" properties you can have with Corning tubing. First, you can see through it for checking flow, volume or quality. Sudden temperature changes won't bother it. Acids and mild alkalies have little effect. It resists corrosion.

For electrical applications, Corning can give you glass tubing that is high in dielectric strength and that seals to metal. Tubing can also be had in various colors. Where precision is required, Corning can supply tubing to extremely close tolerances.

Consider glass tubing in your next design problem. Chances are Corning can furnish you with exactly what you want. You can buy it in small pieces or 10 ft. lengths in diameters from 1 mm. up to 6". Our engineers have the story—they're ready to help you. Drop us a line . . . let us know what you have in mind.

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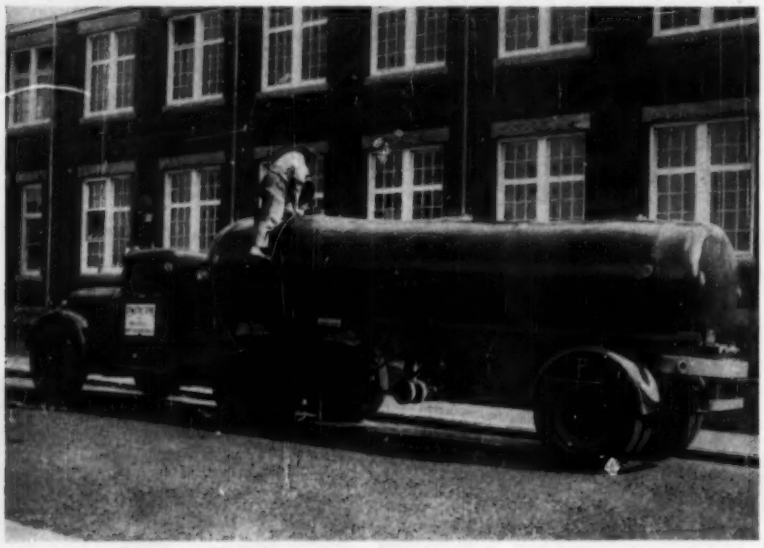


Plastic in Tanker Cuts Weight To Haul, Is Resistant to Chemical Corrosion

Constructed of Laminac polyester resin and fibrous glass molded in one piece, the above tank has a 3,400-gal. capacity. It weighs only 7,025 lb.—3,600 lb. less than a comparable steel tank. Its owner expects to realize $3,357 in increased yearly load from this one tank.

Tank requires no special lining and is impervious to corrosion. If it springs a leak, a patch of plastic impregnated with fibrous glass will seal it with the same strength as the rest of the tank.

Manufacturer of the tank is Carl N. Beetle Plastics Corp., Fall River, Mass. Laminac resin is sprayed over a wood mold to form the tank. A mat of fibrous glass is then placed in position followed by more resin. This procedure continues until final thickness is reached. A special catalyst cures the resin.

Finished tank is fitted to a semi-trailer chassis, designed and built for it by Fruehauf Trailer Co. Trailer has dent-resistant fenders, hose and pump compartments fabricated of the same plastic-glass combination as the tank.

The owner, Mutrie Transportation, Inc., Waltham, Mass., plans to use this first unit for hauling formaldehyde. Under consideration are additional units for liquid alum, alcohols, acetic acid and many other chemicals.—**American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.**—Chem Eng, Oct, p246

Muffles With Fiberglas

This straight-through automobile replacement muffler, the Sportsman, uses Fiberglas wool to help control harsh, high-frequency sounds. The manufacturer says that it was designed also to create minimum back-pressure.

The light, fluffy Fiberglas wool is said to trap sound waves, allowing only the lower, less objectionable noises through. It can be adapted to fit most automobiles.—**Arnold Haviland Co., Defiance, Ohio.**—Am Auto, Nov, p114

Automatic Generator Cuts Straight-Bevel Gears

Model 104 generates Coniflex gears, which are straight bevel gears with localized tooth contact. It is a completely automatic, high-speed (3 to 40 sec. per tooth) machine that cuts gears up to 8½-in. dia., 1⅜-in. face width, and 3 diametral pitch in one operation from a solid blank.

Two multi-blade interlocking, disk-type cutters are 9 in. in dia. and rotate on axes inclined to the face of the cradle. They cut in the same tooth space and can be adjusted to proper cone angle and height setting. Cutter speed varies from 80 to 300 ft. per min.

Gears are indexed intermittently. Rotation of generating train is controlled by a cam that permits roughing and finishing cuts to be made in one cycle.—**Gleason Works, 100 University Ave., Rochester 3, N. Y.**—Am Mach, Sept 28, p174

Centrifugal Pumps

New line of close-coupled centrifugal pumps have been designed for air-conditioning and refrigeration circulation. They are also adaptable for washing, circulation, transfer, sprinkling, and similar applications.

Sizes run from 5 to 50 gal. per min., heads to 105 ft., and ratings from ¼ to 1½ hp. They are low-cost, vertically split, end-suction units with a variable four-position discharge. A self-lubricated mechanical shaft seal makes them both leakless and long lasting. Mounting can be horizontal, vertical, or at any angle.—**Marlow Pumps, Ridgewood, N. J.**—Oil & Gas J, Sept 28, p164

Lights Small Runways

A new, small landing-strip lighting unit reportedly lights runways for as little as 30 cents per ft.

Called the Flying Farmer, the unit is part of a runway lighting package that includes either 12, 24 or 30 lights with cones, lamps, green threshold lights, control switch, and a sufficient amount of No. 10 direct burial conductor.

To install, simply plow a 6-in. furrow, drop in the wire, drive stakes at 200-ft. intervals, and hook up the cable.

Accessories include photoelectric controls, time switches, higher-intensity threshold lights, and small rotating beacons.—**Line Material Co., 700 W. Mighican St., Milwaukee, Wis.**—Aviation Wk, Sept 14, p111

Selenium-Rectifier Welder

Direct-current arc welder has three phase full-wave selenium rectifier, three-phase transformer, and movable core reactor with aluminum coils. A hand crank on the welder case moves the core section in relation to coils to control the welding current.

The welder is available in 200-, 300- and 400-amp. sizes, all having the same size of case, identical bases, covers, fans, motors, mechanical parts, and core punchings. An overload protection opens the circuit in case of overload.—**Westinghouse Electric International Co., 40 Wall St., New York 5, N. Y.**—Weld Eng, Oct, p86

New Pipe Insulator

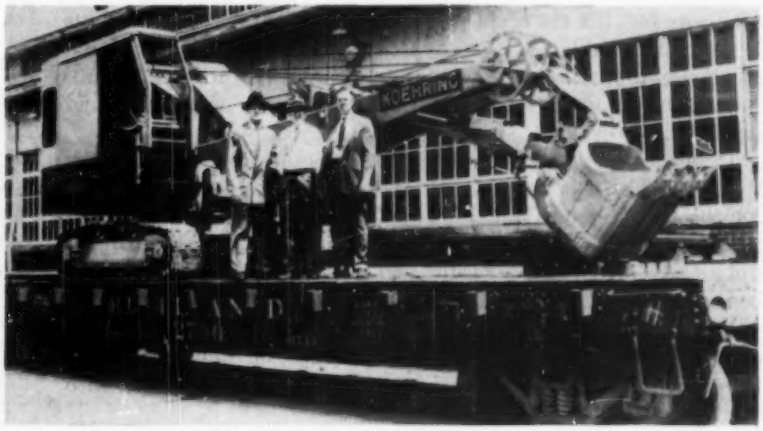
Men in picture above are placing Gilsulate, a solidified form of petroleum, around hot underground pipes. Besides insulating pipe, Gilsulate protects pipe against common corrosion factors such as alkaline ground waters, electrolysis, root attacks, and bacterial action. Tests show heat loss is 8% to 11% of the loss that occurs from bare buried pipes.

No sleeves or sheaths are needed to protect the insulation. It is simply poured into the ditch around the pipe. Repairs or changes can be easily made by removing the backfill and chipping off the Gilsulate.—**American Gilsonite Co., 248 S. Main Street, Salt Lake City 1, Utah**—Business Wk, Oct 10, p86

Portable-Type Composer

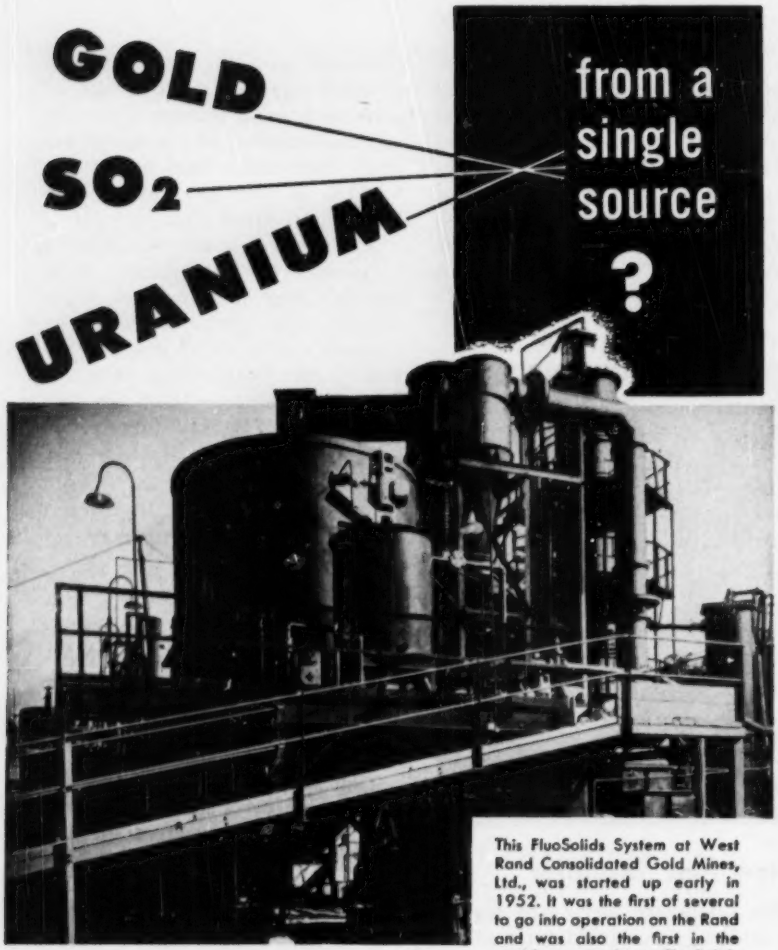
Table-top machine no larger than a typewriter produces sharp headlines on waterproof photo-sensitive paper by means of contact photography. Headlines are reproduced mechanically from master film strips encased in interchangeable magazines.

Type faces range from 144 point to 10 point or smaller. All fonts consist of 93 characters, including caps, lower case, fractions and percentages. A common base line permits intermixing of fonts.—**Halber Corp., 4351 Montrose Ave., Chicago 41, Ill.**—Am Business, Aug, p51



New-Design Crawler Excavator

Rated at ¾-cu. yd. shovel or hoe capacity, new crawler-mounted excavator is being made with simplified upper machinery that involves only two horizontal shafts. Crane capacity of the redesigned model 205 is 10 tons. The unit also may serve as a dragline or clamshell with a choice of diesel, gasoline or electric power. Other improvements include fully enclosed gears, automatic brakes, adjustable hook rollers, and electric dipper trip.—Koehring Co., Milwaukee 16, Wis.—Coal Age, Sept, p120



This FluoSolids System at West Rand Consolidated Gold Mines, Ltd., was started up early in 1952. It was the first of several to go into operation on the Rand and was also the first in the world to combine FluoSolids roasting of pyrites with a contact acid plant.

Gold, SO_2, Uranium . . . all from the same raw material! Improbable combination, but it's standard procedure on South Africa's fabulous Witwatersrand. Gold is recovered from ore by conventional methods; mill tailings are roasted to produce SO_2 for acid manufacture; uranium is recovered from tailings by a sulfuric acid leach.

Important part in this unique process is the Dorrco FluoSolids System, which insures a cheap, abundant source of sulfuric acid for the leaching step. Utilizing the principle of fluidization, this major advance in roasting techniques makes it possible to produce a high-strength SO_2 gas for acid manufacture from low sulfur content material.

Whenever a process involves the separation of finely divided solids in suspension, the use of ion-exchange, or fluid techniques, the chances are we can help you turn your imagination into money.

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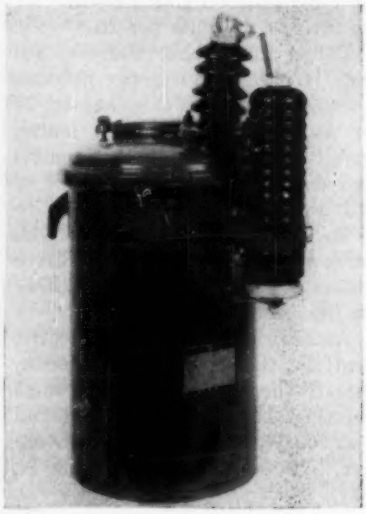
Power Brake Kit

Passenger car power brake, the Hydrovac, is adaptable to all popular automobiles having hydraulic brakes. Complete kit consists of the Hydrovac unit and fittings—including tubing, hose, bracket, and connections. Instructions for step-by-step installation procedure accompany each kit. No special tools or skill are required.

Eleven fittings kits cover all the cars in which the replacement power brake can be installed.—**Bendix Products Div., Bendix International, 72 Fifth Avenue, New York 11, N. Y.**—Auto Ind, Oct 15, p79



Small Lightning Arresters

Two Magne-valve lightweight lightning arresters have been announced for 7,200- and 7,620-v. unit-type distribution transformers. For 7,200-v. transformers, the 9-kv. arrester is 14¼ in. long and weighs 10 lb. The 10-kv. arrester for 7,620-v. transformers is 15½ in. long.

Both arresters are gapped to the bushing and have impulse characteristics similar to those of the company's pellet arresters. The arresters also have Thyrite valve action augmented by magnetic action of internal series gaps. This is said to permit application anywhere on the system without regard to 60-cycle short-circuit currents.—**International General Electric Co., 570 Lexington Ave., New York 22, N. Y.**—Elec World, Sept 7, p138

To keep them on course...

and to bring them safely down

Wherever planes fly, wherever planes land, ISE is ready to offer a helping hand. Radio aids to air navigation—including "DME," the automatic equipment that gives the pilot continuous distance-readings—help speed the aircraft on its way. The famed "ILS" instrument landing system guides it safely to the runway. Airport lighting systems, radio beacon systems, omnidirectional ranges, any needed communications including point-to-point microwave links and ground-to-air transmitters—all are available quickly, economically from International Standard Electric Corporation. This one source can provide everything required for modern airports and airways—from the preliminary engineering to the final supervision of installation.

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Star "Molyflex"—the shatterproof high speed steel hack saw blade—cuts 5 to 10 times more metal than standard steel blades, yet is unbreakable when used in a frame.

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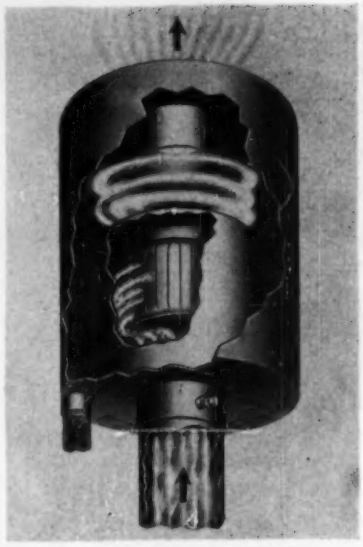
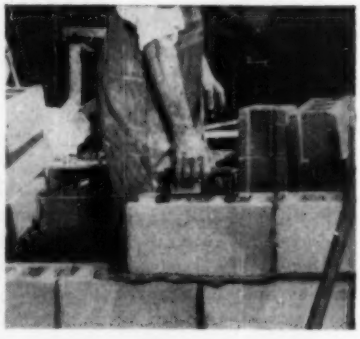


Industrial Exhaust Head

New exhaust head for industrial stacks cleans up exhaust steam and vapors discharged to atmosphere. Unit has no moving parts or filters. Entrainment-laden vapor goes through a stationary centrifugal element. Dirt particles, sludge, oil, and water are guided outward to walls of purifier and ejected out the drain. Dry steam discharges to atmosphere. Manufacturer guarantees 99% efficiency.—**V. D. Anderson Co., 1945 W. 96th St., Cleveland 2, Ohio.**—Power, Mid-Sept, p219



Easier Block Handling

Concrete and cinder block handling is simplified with the Lay-Level carrier. Tool is designed to fit into the block openings to permit the metal teeth to grip the block. Release bar beneath the handle operates by fingertip control to release the tool. Spirit levels built into the handle permit the leveling of the block in place before it is released.—Lay-Level, Inc., P. O. Box 99, Toledo 9, Ohio—Eng News-Rec, Sept 3, p119

NEW PRODUCT BRIEFS

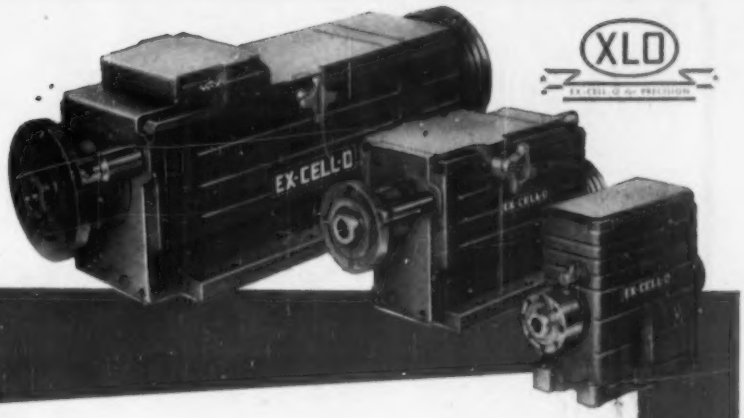
Coating Resists Corrosion—Silicone resin-based coating provides maximum protection against corrosion when applied to surfaces subjected to high thermal conditions. It has a heat range up to and including 1500°F. It also has good flexibility, adhesion, and outdoor weatherability under extreme conditions.—**Rubber & Plastics Compound Co., Inc., 30 Rockefeller Plaza, New York 20, N. Y.**—Factory, Sept, p216

Retards Growth—Post-harvesting growth of potatoes and onions can be retarded by new discovery labeled MH-40. It is sprayed on the crops before they are harvested at a cost of $14 to $19 per acre. Potatoes kept at 55°F. will not sprout for a year after treatment.—**U. S. Rubber Co., 159 E. 42nd St., New York 17, N. Y.**—Business Wk, Sept 5, p75

Conveyor Truck—Arc-welded, A-frame dragline conveyor truck is made without bolts or rivets. Its A-frame design improves rigidity and provides excellent load stability. Truck can be handled manually by push bar when not attached to conveyor.—**Lewis-Shepard, Products, Inc., Watertown, Mass.**—Paper Ind, Sept, p700

Pressure Switch—New switch with explosion-resisting enclosure is recommended for water pumps and air compressors for use where explosive atmospheres are present or when highly combustible fuels must be handled. Enclosure consists of two-piece casting with machined surfaces between cover and case.—**Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.**—Prod Eng, Sept, p222

Lightweight Respirator—Single-cartridge "Gasfoe" respirator has seven independently replaceable parts. Plastic cartridge is factory packed to prevent crushing or channeling of the charcoal fill. Auxiliary overlay screen keeps paint globules from falling into the cartridge.—**Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.**—Ind Dist, Oct, p176



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EX-CELL-O Quill-Type
HYDRAULIC POWER UNITS

Ex-Cell-O Power Units feed or rotate tools in easily controlled automatic cycles. A single tool can be held in the unit spindle or a multiple head can be bolted to the quill flange. The Units are used in low-cost, high-production machines for such operations as drilling, reaming, counterboring and spotfacing. A typical machine consists essentially of a plain base, a work-holding fixture and one or more power units.

Ex-Cell-O Units are self-contained and compact; can be mounted horizontally, vertically with the spindle nose down, or at any angle between these positions.

Ex-Cell-O styles 28-A, 21, and 20 Quill-Type Hydraulic Power Units are shown above. They are standard models. Send for *all* the facts about them. Write or cable Ex-Cell-O for Bulletin 45828.

53-34

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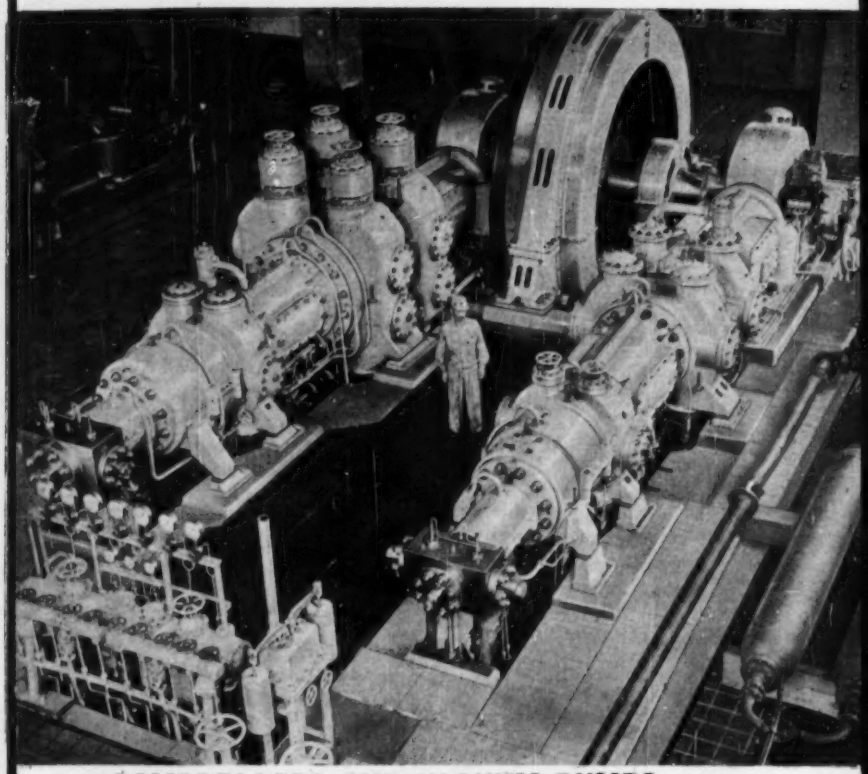

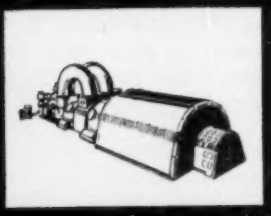

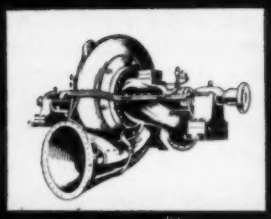

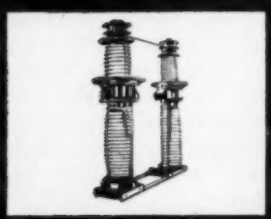

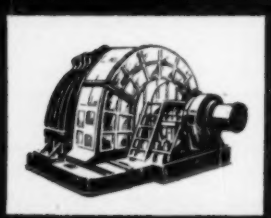

COMPRESSORS AND VACUUM PUMPS
of Impeccable Reliability and Performance

For several decades, the superiority of Hitachi's design has been proven by their outstanding performance, long life, satisfactory operation, and minimized maintenance.

Specially engineered to every industry's requirements, they are now available in a wide variety of capacity and type ranging from fractional horsepower baby compressors to high pressure gas compressors employing several thousand horsepower drive.

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Tokyo Japan

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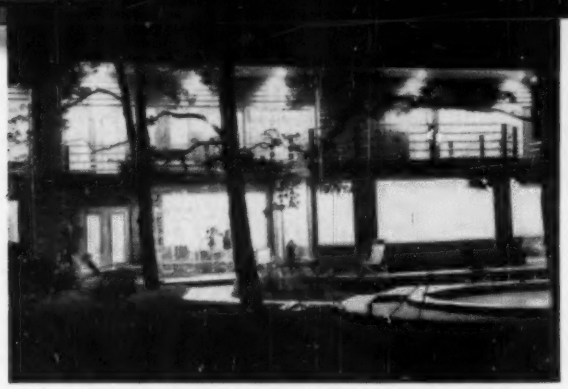
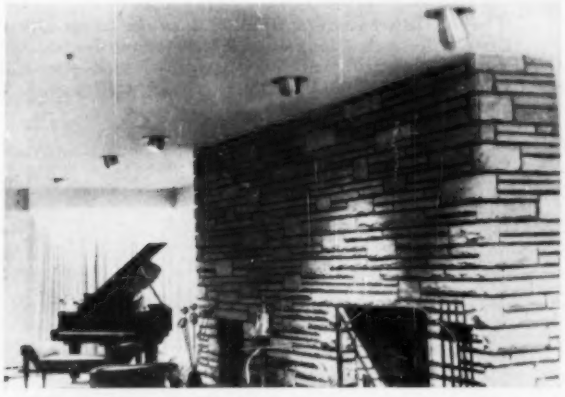


REAR of Rydel, Pennsylvania, house is brightened by fixtures recessed beneath the roof overhang and interior valance lighting. Swimming pool is color-lighted.

APPROACH to the house is dotted with floodlights concealed along the sides. Downlighting on the sides and front of the house is used only for garden parties.



QUIET living room has two fireplaces of natural stone. Incandescent lamps in the ceiling can be moved around to spotlight any part of the room.

FRONT ENTRANCE of $70,000 home in northern Ohio is lighted by incandescent bulbs behind panels of Alsynite. Porch and garage doors are brightly illuminated.

Home Lighting—Artful, Useful

THE WORLD-WIDE BOOM in residential housing has been attended by some imaginative twists in home lighting. Some of the latest are put to use in these two high-priced dwellings, which have won awards for clever use of the latest techniques and materials in the lighting field. Foremost in designers and electrical contractors' minds were two things: the placement and type of lighting must be functional, and pleasing to the eye from any viewpoint.

Revival of the old oriental art of garden and exterior lighting has followed naturally on the heels of waxing interest in outdoor living, but with the accent on usefulness as well as appearance.—Elec C&M, Oct, p86 & 110

FOUNTAIN in back yard is flood-lighted by white or colored reflection flood units. Water in the fountain is recirculating for the home air conditioner.

FLUORESCENT LAMPS behind the valances light the library. One valance directs light toward the ceiling. The other sends it down over the map for TV lighting.

That's why 2-cycle GM Diesel-powered Generator Sets are lighter, take less room, produce more power per unit weight!

Capacities range from 20 to 1000 Kilowatts, and are designed to permit paralleling in varying combinations thus meeting a wide variety of requirements.
Full rated capacity is immediately available on starting — no warm-up period required.
GM 2 cycle Diesel Powered Generator Sets are shipped fully assembled.
Compactness and lightness of weight minimizes installation costs.
Each cylinder has its own injector — adjustments in fuel intake can be made for individual cylinders without having to overhaul the entire system.
GM factory trained service personnel are available for installation and start-up inspections anywhere in the world, thus assuring an effective, dependable source of electric power.

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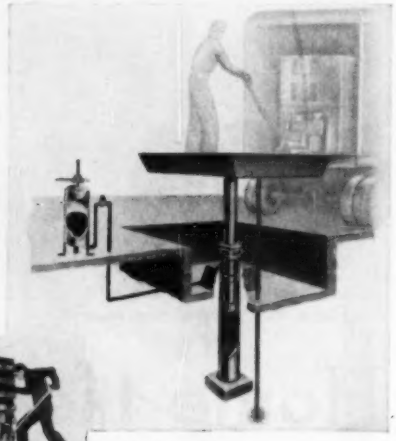
GLOBE model 68 OiLIFT®

Globe's versatile standard OiLIFT can handle practically any lifting job in factories, breweries, stores, warehouses, bottling plants, hospitals, print shops, canneries, airports, railroad terminals.

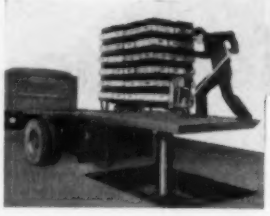
The smooth action of the powerful hydraulic cylinder will lift any load from a few pounds to the maximum capacity of three tons. The heavy duty steel-plate platform measures 6′ x 8′.

Lifting height is controlled quickly and accurately by either an electric pushbutton or a simple lever valve through a lifting range from a few inches to a maximum 4′10″.

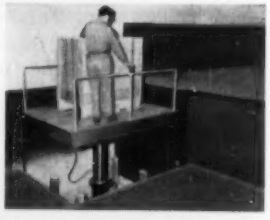
The GLOBE standard OiLIFT is available for immediate shipment. Complete, easy-to-follow instructions enable any ordinary mechanic to install the Lift quickly. Model 68-A is air operated; model 68-E is electric pump operated.



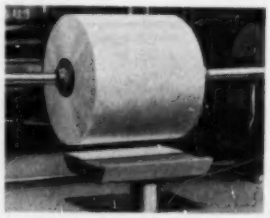
This cutaway view shows the operating principle of the GLOBE OiLIFT. Note non-rotation device which prevents platform from turning.



Here the GLOBE OiLIFT is used for *loading*. Installations like this can be made inside or outdoors for loading trucks, trailers, railroad cars, cargo planes. In "down" position, the platform is flush with floor or driveway—completely out of the way.



Lifting loads between floor levels. Here the GLOBE OiLIFT speeds material handling—and protects workers—by eliminating dangerous ramps and runways. Operator always has the platform under precise control, and the Lift always levels accurately.



The GLOBE OiLIFT speeds the *positioning* of materials. The photo shows how a heavy roll of paper is lifted accurately into position for feeding a printing press. Men, materials, equipment such as welding machines can be positioned accurately in the same manner.

GLOBE
THE BEST LIFT

For complete information, write for Bulletin MHD-556.

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Cotton Basically Altered By Chemical Treatment

Cyanoethylation—the modification of cotton with acrylonitrile—bleaches, adds luster, prevents rot, improves dyeability, and increases abrasion resistance and strength of the treated cotton.

Treatment can take place in an ordinary package-dyeing machine. A 1% solution of caustic soda is placed on the yarn and then the yarn is immersed in 100% acrylonitrile. Amount of reaction is determined by the time and temperature of treatment. Final step is neutralizing with acetic acid and rinsing.

Properties of cyanoethylated cotton are:

Strength: Treated yarn is 30 to 35% stronger than original yarn. If later mercerized, strength is 50% more.

Elongation: Treated yarns have greater elongation than untreated yarns.

Abrasion resistance: Fabrics made from cyanoethylated cotton stand appreciably more cycles on the Stoll tester than fabrics made from untreated cotton.

Rot resistance: Treated yarn containing 3.5% added nitrogen lost no strength when it was buried for two weeks.

Dyeability: With all classes of dyes normally used on cotton, less dyestuff is needed to match shades on untreated cotton.

American Cyanamid Co., a producer of acrylonitrile, cooperated with Institute of Textile Technology in developing cyanoethylation.—Textile World, Oct, p96

Laboratory Simulates Road Test without Roads

Standard Oil Co. of California has built an indoor testing ground for research on the reaction of different fuels on various parts of an entire car or truck.

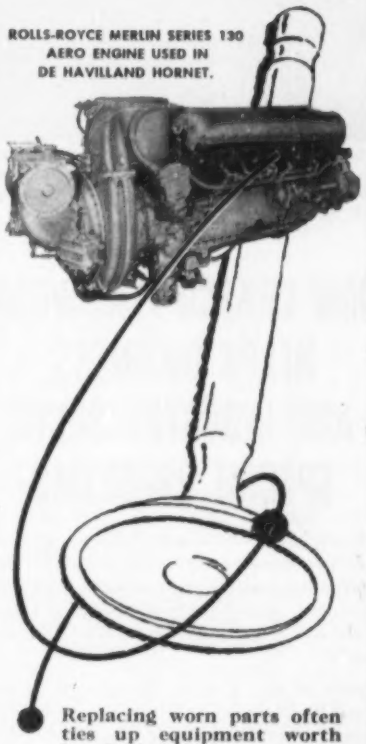
The vehicle is driven into the laboratory so that its back wheels rest on a large drum. The front wheels are anchored. Then it is started and run just as if it were on a highway. The huge drum, revolving under the rear wheels, acts exactly like a road passing beneath the vehicle.

Engineers can simulate hills or other road conditions. To make indoor tests even more realistic, the test room is housed in an insulated cell. It can be heated to 120°F. to simulate desert driving, or chilled to —40°F. A 6-ft. fan blows an airstream past the car.

One series of tests, engineers figure, would have taken at least a week of actual driving at several widely separated sites. In the test room, the series took only 24 hr.—Business Wk, Sept 12, p84

DELORO STELLITE stops wear-worry

ROLLS-ROYCE MERLIN SERIES 130 AERO ENGINE USED IN DE HAVILLAND HORNET.



Replacing worn parts often ties up equipment worth hundreds of times more. Men who make the finest engines have met this problem by insisting on Deloro Stellite Cobalt Chrome Tungsten alloy valve facing. It keeps aircraft flying, trucks and buses in revenue paying service up to 600% longer between overhauls.

In the same way, your conveyors, pumps, valves, power shovels and any equipment needing periodic maintenance can be made to operate from 3 to 25 times longer when you protect their vital parts from corrosive, high temperature or abrasive wear with Deloro Stellite.

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McGRAW-HILL INTERNATIONAL CORP.

By J. A. GERARDI, Treasurer

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(SEAL) ELVA G. MASLIN

Notary Public, State of New York, No. 30-7,750,500
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HOW EBASCO TEAMWORK HELPS BUSINESS AND INDUSTRY SOLVE SPECIAL PROBLEMS

Throughout the United States and in other countries around the world, Ebasco specialists—engineers, constructors and business consultants—are serving many different companies in many different fields.

Some of the services Ebasco offers are used by business and industry to handle projects such as those shown on this page. In turning such problems over to Ebasco, companies of all sizes, long established firms, as well as new businesses, find they obtain the extra manpower they need without adding to their permanent staff.

Perhaps Ebasco teamwork can serve you. Our booklet, "The Inside Story of Outside Help," describes the services we offer business and industry. May we send you a copy? Write or phone Ebasco Services Incorporated, Dept. D, Two Rector Street, New York 6, N. Y.

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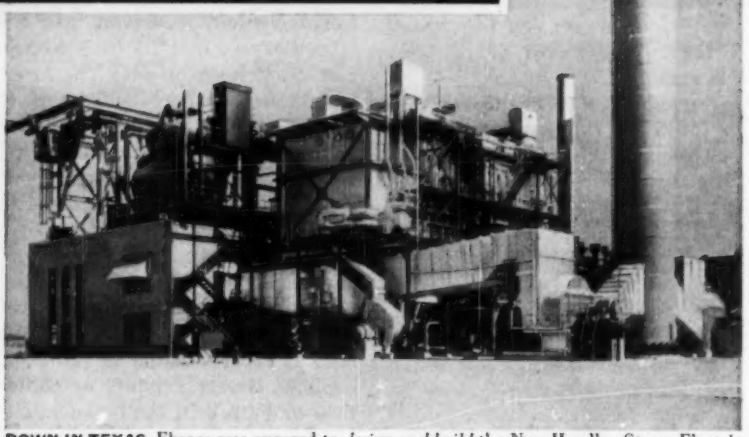
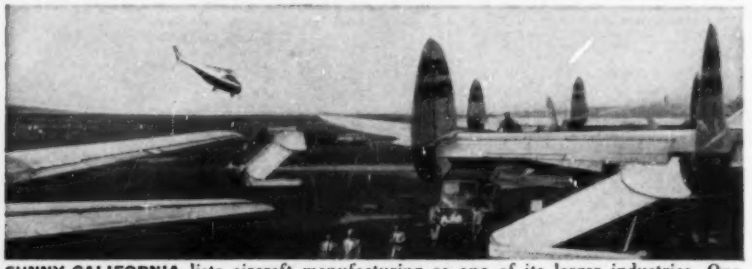


DOWN IN TEXAS, Ebasco was engaged to *design and build* the New Handley Steam Electric Station for Texas Electric Service Co. Located near Fort Worth, this modern plant provides economical electric power to a large part of the State.

TO CARACAS, Venezuela's beautiful capital, Ebasco specialists have gone to handle a *space planning program* for La Electricidad de Caracas. The program involved the planning and designing of a large office building and an ultra-modern service center.

UP IN CANADA, Ebasco specialists prepared an *industrial relations program* for the Canadian Comstock Company Limited. This is one of many such programs prepared by Ebasco for companies in the United States and abroad.



SUNNY CALIFORNIA lists aircraft manufacturing as one of its larger industries. One major company in this field used Ebasco consultants to help *reduce and control costs*, and to provide effective control and coordination of production schedules.

MANAGEMENT REPORT

The idea of a premium—the bonus offered a customer if he buys a certain product—is almost as old as selling itself. Premium selling right now is growing by leaps and bounds. Premiums range from trading stamps to TV sets, tool kits, and deluxe cruises.

A spokesman says that the premium industry is only partly happy about its own prosperity. Premiums come into their own when the job of selling gets tough. There present boom is just one more notice that that day is here.—Business Wk, Oct. 3, p148

A hammer man complained that his company was making exorbitant profits because it charged 30¢ for forging that he made at a 2¢ piece rate and he assumed the other 28¢ was clear profit. So the company, the Steel Improvement & Forge Co., published a cartoon book to show all the operations that go into a forging—from advertising through final billing.

That is just one way that Steel Improvement has improved its employee communications programs. Other ways: an employee newsletter written by the president, an employee handbook, and a series of supervisory dinner meetings. Program benefits are hard to assess accurately as so many are intangible. Evident ones are less labor trouble, more cooperation from employees, and Workmen's Compensation premiums cut in half since the program started in 1947.—Iron Age, Oct 15, p60

Good public relations can prevent a lot of trouble when a new industrial plant is to be built in a residential area. Reliance Electric & Engrg. Co. of Cleveland proved that by holding a series of meetings with near-by home owners when it built a new plant at Euclid, Ohio. It invited them to the Cleveland plant, discussed plans with them, and made many suggested changes.

A 3½-acre "buffer" zone of grass and trees was put between plant and homes. Manufacturing operations were moved to the side of the plant away from the homes. Even the plant was moved 150 ft. farther from the homes. To cap it all, a play area was created and maintained by the company outside the fenced plant property.—Am Mach, Oct 12, p201

The top problem for U. S. businessmen in the foreseeable future is distribution, not production. A 3-day conference on selling was sponsored by the National Industrial Conference Board for 2,500 sales-minded executives. The New York Section of the American Chemical Society plans to present a lecture series on chemical marketing. The National Lubricating Grease Institute stressed distribution at its annual meeting in October, instead of strictly technical subjects as in past meetings.

All this emphasis on selling points up that foreign exporters will have to take a new look at their methods and products, and possibly overhaul them to compete in this market. They have this situation to face: U. S. capacity and demand are substantially in balance with over-capacity in some lines. A Conference Board survey showed 17% of companies reporting over-capacity and only 7% requiring more capacity for their major lines. —Chem Wk, Oct 10, p11 and 80

Plant managements searching for ways to cut production costs would do well to take a long, close look at a report recently published by the Organization for European Economic Cooperation. The report, "Materials Handling Equipment and Methods in the U.S.A.," was prepared by an international European mission of manufacturers and users that visited the U.S. in 1951. It includes many practical examples of efficient handling methods.—Mach, Aug 22, p1404

Alert management men are keeping close watch on developments in ultrasonics because new ideas can save them money in production, distribution, and now even from burglars. The Alertronic Corp. has patented a burglar alarm system that uses ultra-high-frequency sound waves. The equipment is portable, can be moved around to protect different areas, and seems to be tamper-proof as there are no wires that can be cut.

The alarm protects an area by flooding it with the inaudible sound waves. When a moving object enters the area, it sets off the signal by disturbing the wave flow. Although Alertronic is not selling the system as a fire alarm, it does serve this double duty as hot air above a flame disturbs the sound waves and sounds the alarm.

One of the discussion leaders at this year's Conference on Human Relations of the Silva Bay Association was Byron Cherry, management consultant of General Electric Co. He came up with a couple of definitions that might well be widely adopted. Here they are:

- Management's responsibility is to earn the maximum short-range and long-range profit and to provide the maximum service to customers, owners, employees, suppliers, and the whole public.
- True leaders are men who can both lead their organization and follow the lead of their people.

—Factory, Oct, p146

PRODUCTION IDEAS

from Manufacturers' Catalogs

Blast Cleaning Machines—Specifications of hand-operated nozzle blast cleaning machines are given in bulletin 100A.—Pangborn Corp., Hagerstown, Maryland.

Power Equipment—Bulletin WP-1099-B13 gives data on steam power plant equipment such as condensers, circulating pumps, steam-jet ejectors, and turbines.—Worthington Corp., Harrison, N. J.

Retaining Rings—Engineering data and specifications of Truarc retaining rings are given in catalog. Assembly and accessory tools are also described. —Waldes Kohinoor Inc., 47-16 Austel Pl., Long Island City 1, N. Y.

Crushing Equipment—Rock, gravel and lime crushing, screening, loading, and washing equipment are described in bulletin U600.—Universal Engineering Corp., Cedar Rapids, Iowa.

Demineralization—Bulletin 3803 covers demineralization and silica removal by the use of ion-exchange resins.—Permutit Co., 330 West 42nd St., New York 36, N. Y.

Heavy Fork Lift—Folder 1230 tells about new 8,000-lb. capacity pneumatic tire, inside-outside fork truck. Pictures show truck in actual use.—Hyster Co., 2902 N. E. Clackamas, Portland 8, Ore.

Cutting Tools—Catalog 52 lists and describes tools covering a wide field of application for the majority of your machining problems. — Kennametal, Inc., Latrobe, Pa.

Plastic Eye Protection — Plastic goggles, masks and glasses for all types of dangerous industrial work are described in 19-page folder S-398.—American Optical Co., Southbridge, Mass.

Gasoline Hammers—Designed for one man operation, these hammers in Bulletin 613 are self-contained. Recommended uses: pavement breaking, rock drilling, rod and sheathing driving.—Barco Manufacturing Co., 1801 Winnemac Ave., Chicago 40, Ill.

Pneumatic Regulators — Catalog 29 describes the new constant-pressure differential regulator and the new instrument air-pressure regulator.—Fischer & Porter Co., Hatboro, Pa.

Airfoil Centrifugal Fans—Leaflets No. 600 and 1320 list uses of airfoil fans where low operating costs and quiet operation mean more than first cost.—Westinghouse Electric Int'l. Corp., 40 Wall Street, New York, N. Y.

Narrow-gage Locomotives—55 B.H.P. and 28 B.H.P. diesel narrow-gage locomotive and diesel shunting locomotive with air-cooled engine are described in two folders.—Klockner-Humboldt-Deutz AG. Koln, Germany.

Oil Country Pumps—All types of pumps for oil-field work are the subject of a 20-page brochure. Write for bulletin 0-53.—Marlow Pumps, Ridgewood, N. J.

Stationary Diesel—Bulletin 197 contains construction and operating data on Nordberg four-cycle SUPAIR-THERMAL V-Type stationary or marine engines.—Nordberg Manufacturing Co., Milwaukee 1, Wisconsin

Removes Entrainment—Folder describes line-type Hi-eF Purifiers for 99% removal of entrained liquids, oil or dirt from live or exhaust steam. —V. D. Anderson Co., 1935 West 96th Street, Cleveland 2, Ohio

Refinery Pumps—Construction details and features of new refinery type pump are described. Bulletin 52B7775 contains charts, diagrams, dimensions, performance data on single-suction single-stage pump. — Allis-Chalmers Mfg. Co., Export Dept., Milwaukee 1, Wisconsin

Titanium Dioxide Pigment—Technical bulletin No. 906 gives details of pigment dispersion of titanium dioxide using the intensive mixing procedure. —American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.

Machine Tool Chucks—General catalog describes plain and ball-bearing chucks, lathe chucks, tap chucks and collet chucks for machine tools.—The Jacobs Mfg. Co., Hartford 2, Connecticut

Machinery and Tools — Illustrated folder tells about unusual company that designs and builds tools for the automatic factory. — Simmons Machine Tool Corp., Export Div., 50 East 42nd St., New York 17, N. Y.

Electric Typing—Booklet RE 8612 tells how company can have the advantages of electric typing for as little as 11¢ per day.—Remington Rand Inc., 315 Fourth Ave., New York 10, N. Y.

Gear Drives—Enclosed herringbone-gear drives for power transmission are subject of 36-page book No. 2519. —Link Belt Company, 233 Broadway, New York 7, N. Y.

Diesel Crawler—Action photographs and specification data on TD-18A Diesel Crawler are subject of illustrated pamphlet.—International Harvester Export Co., 180 No. Michigan Ave., Chicago 1, Ill.

Series Motor Parts—Bulletin GET-2297 gives technical data and GEA-5665 lists available engineering consultation service, design problems on type BA motor parts.—International General Electric Co., 570 Lexington Ave., New York, N. Y.

Horizontal Presses—Folder 10-KRW gives specifications on 25- to 150-ton capacity hand, air-oil and motor operated horizontal presses. Folder KRW covers hand-operated hydraulic presses.—K. R. Wilson, 215 Main Street, Buffalo 3, N. Y.

Power Industrial Trucks—Condensed general catalog describes high and low lift platform trucks, fork trucks and mobile cranes along with capacities and dimensional specifications for many applications. — Elwell-Parker Electric Company, 4205 St. Clair Ave., Cleveland 3, Ohio

Calculating Machines—"The right machine for every job means better work at mininmum cost" is the theme of Form C 1144, a color booklet on selecting the right calculator for your office. —Burroughs Corp., Detroit 32, Michigan

Electric Generating Plants — Pocket size booklet covers selection of engine-driven electric generating plants. Describes three general groups: ac dc, and battery charging. Ask for "Blue Book."— D. W. Onan & Sons Inc., Minneapolis, Minn.

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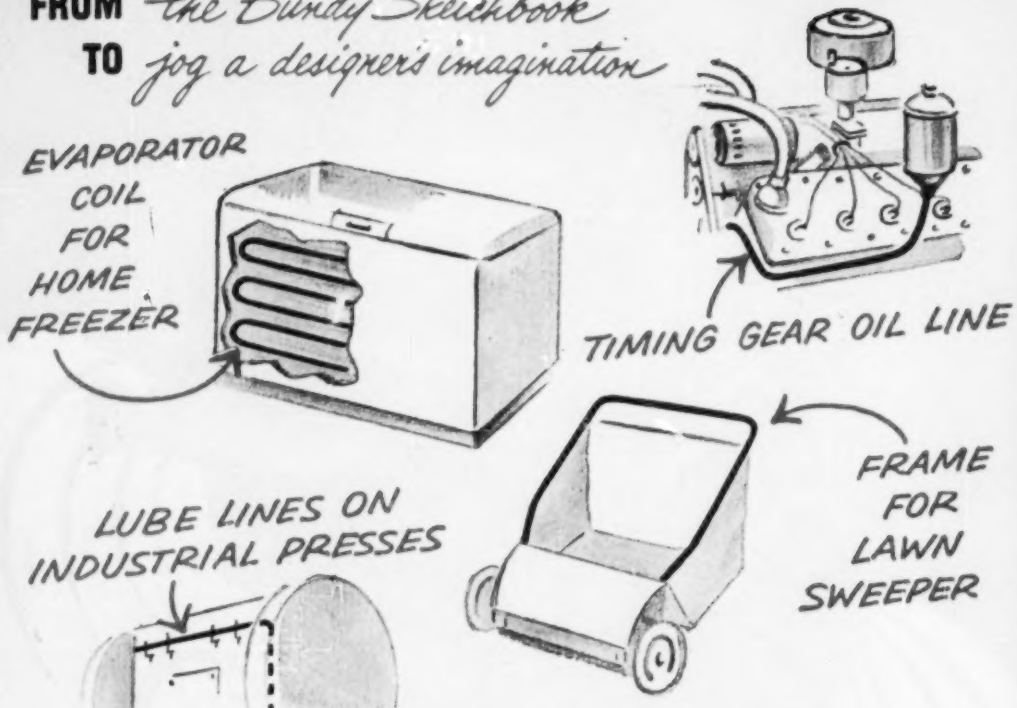

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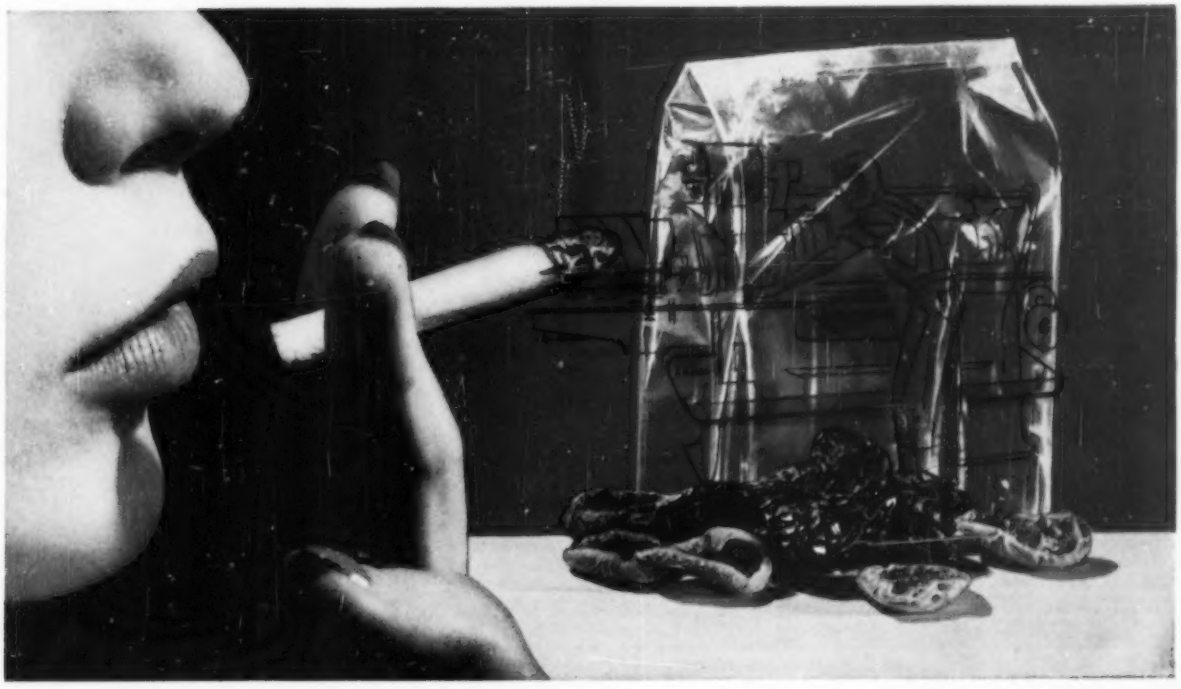

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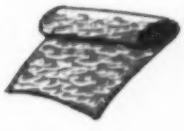

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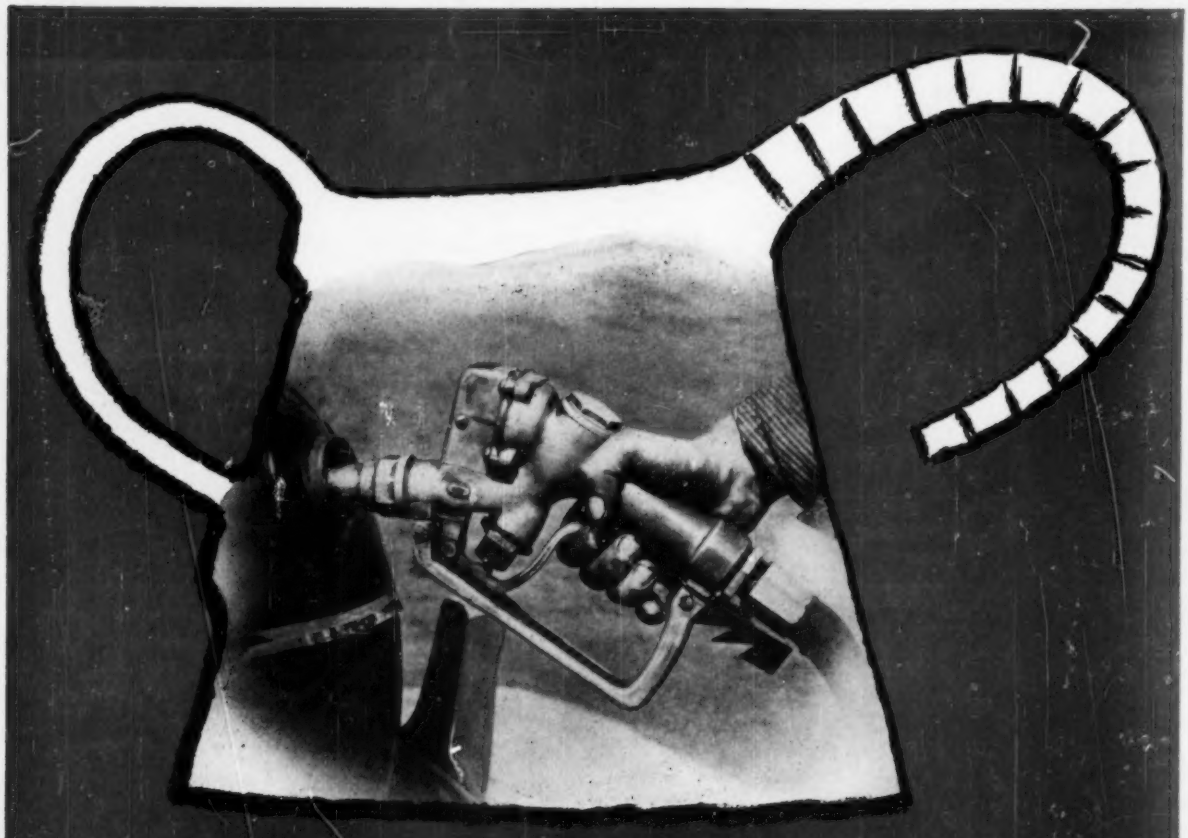

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